UNITED NATIONS

A

General Assembly

Distr.
LIMITED

A/AC.105/L.184
30 April 1990

ORIGINAL: ENGLISH

COMMITTEE ON THE PEACEFUL USES
OF OUTER SPACE
Thirty-third session
4-15 June 1990

PROVISIONAL AGENDA FOR THE THIRTY-THIRD SESSION

To be convened at United Nations Headquarters, New York,
on Monday, 4 June 1990 at 3 p.m.

1. Adoption of the agenda.

2. Statement by the Chairman.

3. General exchange of views.

4. Ways and means of maintaining outer space for peaceful purposes.*

5. Report of the Scientific and Technical Sub-Committee on the work of its twenty-seventh session (A/AC.105/456).

6. Report of the Legal Sub-Committee on the work of its twenty-ninth session (A/AC.105/457).

7. Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space.

8. Spin-off benefits of space technology: review of current status.

9. Other matters.

10. Report of the Committee to the General Assembly.

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* Priority item in accordance with paragraph 26 of General Assembly resolution 44/46.

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ANNOTATIONS*

Items 1, 2 and 3: Adoption of the agenda

Statement by the Chairman

General exchange of views

1. Following the adoption of the agenda by the Committee and the organization of its work, the Chairman will make a statement reviewing developments of relevance to the work of the Committee that have taken place since its thirty-second session.

Item 4: Ways and means of maintaining outer space for peaceful purposes

2. The General Assembly, in resolution 44/46, paragraph 26, requested the Committee to continue to consider, as a matter of priority, ways and means of maintaining outer space for peaceful purposes and to report thereon to the Assembly at its forty-fifth session.

3. The General Assembly, in paragraph 25 of the same resolution, took note of the views expressed and documents circulated during the thirty-second session of the Committee and during the forty-fourth session of the Assembly concerning ways and means of maintaining outer space for peaceful purposes.

Item 5: Report of the Scientific and Technical Sub-Committee on the work of its twenty-seventh session (A/AC.105/456)

4. At its twenty-seventh session, the Scientific and Technical Sub-Committee, in accordance with the recommendation of the Committee in its report to the General Assembly at its forty-fourth session 1/ and paragraph 8 of resolution 44/46, considered the following questions:

(a) United Nations Programme on Space Applications and the co-ordination of space activities within the United Nations system

5. The Sub-Committee conducted, on a priority basis, a joint consideration of the United Nations Programme on Space Applications and the implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE 82). 2/ The Sub-Committee's report contains a review of the Space Applications Programme and its activities for 1989 and 1990 and recommendations for approval of the proposed activities for 1991. 3/

6. Regarding the co-ordination of space activities within the United Nations system, the Sub-Committee, in its report, continued to stress the necessity of ensuring such co-ordination. 4/

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* The annotations are not part of the agenda to be adopted by the Committee.

(b) Matters relating to remote sensing of the Earth by satellite, including applications for developing countries

7. The Sub-Committee continued consideration of this item on a priority basis, and the views expressed are reflected in its report. 5/ The Sub-Committee recommended that the item should be retained on its agenda as a priority item for the next session and that sufficient time should be allocated for its consideration. 6/

(c) Use of nuclear power sources in outer space

8. The Sub-Committee continued consideration of this item on a priority basis and reconvened its Working Group on the Use of Nuclear Power Sources in Outer Space in accordance with paragraph 12 of General Assembly resolution 44/46. The Sub-Committee adopted the report of the Working Group, 7/ which contains, in particular, recommendations for the safe use of nuclear power sources in outer space. 8/ The views of the Group on a number of other questions discussed relating to the use of nuclear power sources in outer space are also contained in the report. 9/

9. In paragraph 60 of the report, the Sub-Committee recommended that the subject be retained as a priority item on its agenda for the next session, and, noting that, with its current report, the Working Group had completed the elaboration of scientific and technical criteria for the safe use of nuclear power sources in outer space, recommended further that the question of reconvening the Working Group be considered by the Committee at this session, in that context as well as in the light of the work carried out by the Legal Sub-Committee on the subject at its twenty-ninth session.

(d) Questions relating to space transportation systems and their implications for future activities in space

10. During the course of its discussion on this item, the Sub-Committee took note of the developments in the various programmes relating to space transportation systems. 10/ It recommended that the item be retained on its agenda for the next session. 11/

(e) Examination of the physical nature and technical attributes of the geostationary orbit; examination of its utilization and applications, including in the field of space communications, as well as other questions relating to space communications developments, taking particular account of the needs and interests of developing countries

11. The Sub-Committee continued consideration of this item, and the views expressed are reflected in paragraphs 66 to 70 of its report. In paragraph 71 of the report, it recommended that its consideration of the item be continued.

(f) Matters relating to life sciences, including space medicine

(g) Progress in the geosphere-biosphere (global change) programme

(h) Matters relating to planetary exploration

(i) Matters relating to astronomy

12. The Sub-Committee continued consideration of these items, and the views expressed are reflected in paragraphs 73 to 75, 77 to 79, 80, 82, 83, 85 and 86 of its report. It recommended that these items be retained on its agenda for the next session.

(j) The theme fixed for the special attention of the 1990 session of the Scientific and Technical Sub-Committee: "The use of space technology in terrestrial search and rescue and in disaster relief activities"

13. The Sub-Committee paid special attention to this theme and noted with satisfaction that a special symposium organized by the Committee on Space Research (COSPAR) and the International Astronautical Federation (IAF) on the theme had taken place.

14. The Sub-Committee set out in paragraph 106 of its report the new theme fixed for special attention at its twenty-eighth session, "Applications of airborne and satellite remote sensing for prospecting mineral and ground-water resources and for monitoring and managing biological resources, with emphasis on agriculture, taking into particular account the needs of developing countries".

(k) Other matters

15. The Sub-Committee noted that the General Assembly, in paragraphs 20 and 21 of its resolution 44/46, had endorsed the initiative of international scientific organizations and bodies to designate 1992 as International Space Year, as well as the recommendation of the Committee that international co-operation should be promoted through the Year, which should be carried out for the benefit and in the interests of all States, taking into particular account the needs of developing countries. 12/

16. The Sub-Committee also urged other Member States and international organizations to consider supporting additional scientific and technical activities in co-operation with the United Nations as part of the Year and, in this connection, noted that it was particularly important to increase voluntary contributions for activities to be carried out during the year through the United Nations Programme on Space Applications. 13/

17. The Sub-Committee noted the primary focus of proposed activities during the Year on the use of space technology for studying and monitoring the environment. The United Nations Conference on Environment and Development was also being planned for 1992 and recommended that Member States, in planning their activities for the Year, should consider ways in which those activities could complement the efforts under way for the Conference on Environment and Development. 14/

READEX FICHE

18. On the question of space and earth environment, 15/ the Sub-Committee also noted that the General Assembly, in paragraph 22 of resolution 44/46, had recommended that more attention be paid to all aspects related to the protection and preservation of the outer space environment, especially those potentially affecting the Earth's environment.

19. The Sub-Committee noted further that the General Assembly, in paragraph 23 of resolution 44/46, had considered that it was essential that Member States pay more attention to the problem of collisions with space debris, and other aspects of space debris, and called for the continuation of national research on that question. The Sub-Committee took note of the studies relating to space debris that had been carried out by Member States. 16/

20. The views expressed on several other matters are covered in paragraphs 102 to 104 of the report.

21. The Sub-Committee set out in its report, in particular in paragraphs 105 to 109, the proposed agenda items for its twenty-eighth session, including the new theme fixed for special attention at that session. It recommended that the agenda item previously entitled "Progress in the geosphere-biosphere (global change) programme" should be changed to "Progress in national and international space activities related to the Earth environment, in particular progress in the geosphere-biosphere (global change) programme". Noting the significant progress that had been achieved in its consideration of the item on the use of nuclear power sources in outer space, the Sub-Committee also recommended that the Committee, at this session, should consider the future work of the Sub-Committee and the ways in which it affects the work of the Legal Sub-Committee, in particular on the agenda item on nuclear power sources in outer space.

Item 6: Report of the Legal Sub-Committee on the work of its twenty-ninth session (A/AC.105/457)

22. At its twenty-ninth session, the Legal Sub-Committee, in accordance with General Assembly resolution 44/46, paragraph 4, considered the following matters:

(a) The elaboration of draft principles relevant to the use of nuclear power sources in outer space

23. The Sub-Committee, through its Working Group, continued its consideration of this item; a summary of the discussion in the Group is contained in the report of the Sub-Committee. 17/

24. The Sub-Committee noted with particular satisfaction that Principle 3 relating to guidelines and criteria for safe use had been unanimously agreed to by the Working Group at the present session. 18/

25. The Sub-Committee also agreed to the suggestion put forward by the delegation of Canada that an informal meeting of interested delegations be held in New York during the first week of this session of the Committee on the Peaceful Uses of Outer Space with a view to proceeding to a first exchange of views on the working

paper A/AC.105/C.2/L.154/Rev.6, which contains draft principles 2, 4, 8, 9, 11 and 12 which have not yet been agreed to by the Sub-Committee.

(b) Matters relating to the definition and delimitation of outer space and to the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union

26. The Sub-Committee, through its Working Group, continued its consideration of this item; a summary of the discussion in the Working Group is contained in annex II to the report of the Sub-Committee.

(c) Consideration of the legal aspects related to the application of the principle that the exploration and utilization of outer space should be carried out for the benefit and in the interests of all States, taking into particular account the needs of developing countries

27. The Sub-Committee took up this new item in accordance with General Assembly resolution 44/46, paragraph 4 (c), and the various views expressed on this item are contained in paragraphs 44 to 60 of its report.

28. With respect to the future consideration of this item, including the question of the establishment of a working group, in accordance with General Assembly resolution 44/46, paragraph 5, the Sub-Committee established a working group, open to all States members of the Sub-Committee, to commence its work at the thirtieth session of the Sub-Committee in 1991 and agreed that Mr. Raimundo González, the representative of Chile, should serve as its Chairman. 19/

29. The Sub-Committee also recommended that the Secretary-General should reissue his request to Member States for information on their national legal frameworks and international agreements, as noted in paragraphs 40 and 41 of the report.

(d) Organization of work

30. The Sub-Committee adopted a number of decisions concerning the organization of its work as contained in paragraphs 11, 15, 16 and 17 of its report. The Sub-Committee took note of General Assembly resolution 44/201 B, section III, which concerns, inter alia, the question of the venue of the Sub-Committee's future sessions. The Sub-Committee was of the view that the provisions of that resolution should be taken into account by the Committee at this session when it will make, among other things, recommendations concerning the programme of the future work of the Legal Sub-Committee, including the dates and venues of the Sub-Committee meetings.

Item 7: Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space

31. As mentioned in paragraph 5 above, the Scientific and Technical Sub-Committee conducted, on a priority basis, a joint consideration of this item and of the United Nations Programme on Space Applications. The Sub-Committee, in its report, noted developments relating to the International Space Information Service, studies, inter-agency co-operation and regional and interregional mechanisms of co-operation. 20/

32. The Sub-Committee reconvened, in accordance with paragraph 10 of General Assembly resolution 44/46, the Working Group of the Whole to Evaluate the Implementation of the Recommendations of the UNISPACE 82 Conference. The Sub-Committee adopted the report of the Working Group, 21/ which contains recommendations addressed to the Committee on the further implementation of the recommendations of UNISPACE 82 and the work of the Secretariat. 22/

Item 8: Spin-off benefits of space technology: review of current status

33. The General Assembly, in paragraph 27 of resolution 44/46, requested the Committee to continue to consider at its thirty-third session its agenda item entitled "Spin-off benefits of space technology: review of current status".

Item 9: Other matters

34. The Committee will have before it a list of experts on space science and technology 23/ and a report on the technical presentations made in the Scientific and Technical Sub-Committee. 24/ Additional reports may be submitted to the Committee as available. The Committee may wish to discuss other matters as appropriate.

Item 10: Report of the Committee to the General Assembly

Notes

1/ Official Records of the General Assembly, Forty-fourth Session, Supplement No. 20 (A/44/20), para. 121.

2/ A/AC.105/456, paras. 17-46.

3/ Ibid., paras. 25-35.

4/ Ibid., para. 42.

5/ Ibid., paras. 47-55.

6/ Ibid., para. 56.

7/ Ibid., annex III.

Notes (continued)

8/ Ibid., annex III, sect. III, paras. 15 and 16.

9/ Ibid., annex III, sect. II, paras. 5-14.

10/ Ibid., paras. 61-64.

11/ Ibid., para. 65.

12/ Ibid., paras. 91-96.

13/ Ibid., para. 92.

14/ Ibid., para. 94.

15/ Ibid., paras. 97-101.

16/ Ibid., para. 98.

17/ A/AC.105/457, annex 1.

18/ A/AC.105/457, para. 30.

19/ Ibid., paras. 11 (d) and 42.

20/ Ibid., para. 18.

21/ A/AC.105/456, annex II.

22/ Ibid., annex II, paras. 4-6.

23/ A/AC.105/460.

24/ A/AC.105/459.

Annex

PROVISIONAL SCHEDULE OF WORK

Date	Morning	Afternoon
Monday, 4 June		Item 1 - Adoption of the agenda Item 2 - Statement by the Chairman Item 3 - General exchange of views
Tuesday, 5 June	Item 3 (continued)	Item 3 (continued)
Wednesday, 6 June	Item 3 (continued)	Item 4 - Ways and means of maintaining outer space for peaceful purposes
Thursday, 7 June	Item 4 (continued)	Item 4 (continued)
Friday, 8 June	Item 5 - Report of the Scientific and Technical Sub-Committee	Item 5 (continued)
	Item 7 - Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space	Item 7 (continued)
Monday, 11 June	Item 5 - Report of the Scientific and Technical Sub-Committee (continued)	Item 6 - Report of the Legal Sub-Committee
	Item 7 - Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (continued)	
Tuesday, 12 June	Item 6 (continued)	Item 6 (continued)
Wednesday, 13 June	Item 8 - Spin-off benefits of space technology	Item 8 (continued)
Thursday, 14 June	Item 9 - Other matters	Item 10 - Report of the Committee to the General Assembly
Friday, 15 June	Item 10 (continued)	Item 10 (continued)

UNITED
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General Assembly

Distr.
LIMITED

A/AC.105/L.184/Corr.1
11 May 1990

ORIGINAL: ENGLISH

COMMITTEE ON THE PEACEFUL USES
OF OUTER SPACE
Thirty-third session
4-15 June 1990

PROVISIONAL AGENDA FOR THE THIRTY-THIRD SESSION

To be convened at United Nations Headquarters, New York,
on Monday, 4 June 1990 at 3 p.m.

Corrigendum

Page 3, heading (b), line 1

After the word "including", insert the words ", inter alia,"

Page 3, heading (e), line 3

After the word "including", insert the words ", inter alia,"

Page 4, paragraph 16

For the existing text substitute

16. The Sub-Committee also urged other Member States and international organizations to consider supporting additional scientific and technical activities in co-operation with the United Nations as part of the Year and, in this connection, noted that it was particularly important to increase voluntary contributions to the United Nations Programme on Space Applications for activities to be carried out in connection with the Year.

Page 7, paragraph 34, line 5

After the word appropriate, insert

, including the requests from the International Law Association (ILA) and the International Society for Photogrammetry and Remote Sensing (ISPRS) for observer status in the Committee.

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UNITED
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General Assembly

Distr.
LIMITED

A/AC.105/L.185
1 June 1990
ENGLISH
ORIGINAL: CHINESE

COMMITTEE ON THE PEACEFUL USES
OF OUTER SPACE
Thirty-third session
4-15 June 1990

INTERNATIONAL SPACE YEAR

Working paper submitted by China

1. China supports the decision taken by the General Assembly at its forty-fourth session regarding 1992 as International Space Year. China welcomes the fact that International Space Year will make the protection and improvement of the global environment the major thrust of the "Mission to Planet Earth" programme and is working to ensure that developing countries derive increasing benefits from space technology applications.

2. The Chinese Government considers environmental protection to be a basic national policy and seeks to co-operate with other countries in ISY activities in order to protect and enhance man's living environment while endeavouring to develop the Earth's natural resources rationally and also providing assistance to the international community.

3. China believes that ISY activities should be carried out at the international, regional and national levels and that major activities, based on projects identified by individual countries, should be implemented with voluntary contributions from each country. China proposes that the Committee on the Peaceful Uses of Outer Space and its Sub-Committees convene a relatively solemn formal meeting in 1992 to mark International Space Year. China also suggests that a special meeting be held during the forty-seventh session of the General Assembly to commemorate International Space Year.

4. China has established the Chinese Preparatory Commission for International Space Year (ISY-CPC) under the chairmanship of Dr. Song Jian, with the eminent scientists Wong Daheng and Zhuang Fenggan as Vice-Chairmen and Professor Ma Junru as Secretary. ISY-CPC will make contact with all relevant national and international organizations on matters relating to participation and co-operation in ISY activities.

5. China would like to organize or participate in ISY activities in the following areas:

(a) China would like to host a meeting of the Space Agency Forum for International Space Year (SAFISY) at Beijing;

(b) In conjunction with the programmes of relevant United Nations organizations, China plans to conduct a series of international symposia and training courses as ISY activities. The following have been held or are scheduled:

(i) The National Meteorological Bureau of China was asked by the United Nations Development Programme (UNDP) and the World Meteorological Organization (WMO) to conduct a study group on the uses of meteorological satellites at Beijing from 7 to 26 May 1990;

(ii) An international symposium on climate change is to be held in China in August 1990;

(iii) In September 1991, China will hold an international symposium at Beijing on the utilization of space technology in dealing with disasters; as part of the Space Applications Programme, the symposium will consider how space technology can be used to forecast, assess and provide relief in the case of sudden natural disasters throughout the world;

(c) China intends to carry out the following scientific and applied research activities:

(i) A study of the solar-terrestrial system over 22 cycles of solar activity;

(ii) A study of materials and life science under conditions of microgravity in space;

(iii) A study of current movements and dynamics of the Earth's crust (focusing on the Qinghai-Xizang region);

(iv) Ecological monitoring studies and studies of global pollution fluxes;

(v) Launching of multi-purpose satellites, including large-capacity communications/broadcasting satellites, solar-synchronous orbit weather satellites, multi-purpose resource satellites and retrievable satellites;

(vi) Utilization of sounding rockets and the development and testing of 5 million m^3-300,000 m^3 high-altitude balloons;

(vii) Utilization of remote-sensing technology in setting up a national system for rapid natural disaster assessment;

(viii) Promotion of communications and televised instruction via satellite to solve the problem of training 2.4 million teachers and educating 8 million adults;

UNITED
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General Assembly

Distr.
LIMITED

A/AC.105/L.185/Corr.1
5 June 1990

ORIGINAL: ENGLISH

COMMITTEE ON THE PEACEFUL USES
OF OUTER SPACE
Thirty-third session
4-15 June 1990

International Space Year

Working paper submitted by China

Corrigendum

Paragraph 4, first sentence

For the existing text substitute

China has established the Chinese Preparatory Commission for International Space Year (ISY-CPC) under the Honorary Chairmanship of Dr. Song Jian, with the eminent scientists Wong Daheng as Chairman, Zhuang Fenggan as Vice-Chairman and Professor Ma Junru as Secretary.

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(ix) In the field of data exchanges, preparation of a series of maps relating to disasters in China as well as ocean maps;

(x) Preparation of videos and popular scientific articles and publications relating to International Space Year;

(xi) Establishment of a national natural disaster data base and provision of pertinent data to the appropriate national organizations.

6. China is interested in participating in co-operative global projects in the following areas:

(a) Global land change;

(b) The declining global forest cover;

(c) The hole in the ozone layer; oceanic ice;

(d) Computerized encyclopaedia and mapping of global change, etc.

UNITED
NATIONS

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General Assembly

Distr.
LIMITED

A/AC.105/L.186
5 June 1990
ENGLISH
ORIGINAL: RUSSIAN

COMMITTEE ON THE PEACEFUL
USES OF OUTER SPACE
Thirty-third session
4-15 June 1990
Agenda item 5

REPORT OF THE SCIENTIFIC AND TECHNICAL SUB-COMMITTEE ON THE WORK OF ITS TWENTY-SEVENTH SESSION

REMOTE SENSING OF THE EARTH: OKEAN PROGRAMME

Working paper submitted by the Union of Soviet Socialist Republics

Space facilities for routine investigation of the Earth's resources and for monitoring the environment are being developed in the form of two multipurpose platforms, types A and B.

There are two variations of platform A: one is now in use (fig. 1 and 2) and the other is under development (fig. 3 and 4).

Platform A is a spacecraft that is oriented towards Earth by means of a gravity-gyro attitude-control system. It has a vertical arrangement and consists of a pressurized container, solar batteries mounted on a rotatable arm, and four revolving panels attached to the pressurized container and designed to accommodate the research instruments. Certain instruments requiring favourable operating conditions are housed in a special compartment of the pressurized container. The location of the main research instruments on the panels allows the payload configuration to be easily changed in order to carry out a range of specific tasks.

The support equipment of platform A contains the control and measurement system, the telemetry system, the attitude-control and stabilization system and the electric-power-supply and thermal-control systems.

The A-type platforms (Cosmos-1500, 1602, 1766, 1869, Okean) transmit research data via analogue radio links in the decimetre (466.5 MHz) and metre (137.4 MHz) wavebands.

In view of the low accuracy of orientation of the platform A currently in use, the project includes plans to upgrade the platform by installing a special attitude-indication system, ensuring continuous monitoring of the attitude of the spacecraft with an accuracy of 2 minutes of arc, and by converting to digital radio links for X-band transmission of data at a speed of 15.36 Mbits/s.

Platform B is also being developed as a unified base which can be equipped with various sets of research instruments.

The first set of instruments (fig. 5 and 6) has been developed and is now being manufactured. A second set is at the design stage, and will represent an improved arrangement of research and support instrumentation.

The basic configuration (fig. 5 and 6) consists of a pressurized instrumentation container with compartments for research and support instruments, the solar battery, the propulsion system, the external truss, and special pads for mounting the external research-instrument packages. The external truss, the special pads and the internal truss of the research-instrument compartment constitute a variable part of the structure which can be changed to accommodate differing payload configurations.

The distinguishing feature of the structural layout of platform B is the horizontal arrangement of the pressurized container and of the main external truss, an arrangement which makes it easy to accommodate a considerable number of instruments, including large ones, for remote sensing of the Earth.

As can be seen from figures 5 and 6, the proposed payload for the early launches of platform B is provided with sufficient free space and could in future be greatly expanded.

The support equipment of platform B includes the control and measurement system, the system for controlling the on-board instrumentation, the data-telemetry system, the propulsion system, the electric-power-supply and thermal-control systems and the on-board system for X-band transmission of research data.

Provision is also made for the installation on the platform, where necessary, at the users' request, of navigation instruments to ensure highly accurate referencing based on the data of existing space navigation systems, and of an additional radio link for routine data transmission directly to users via the simplified reception centres or the relay satellite.

The improvement of platforms A and B is planned with a view to prolonging their active life, improving their capabilities (in terms of weight, dimensions, and electric-power consumption of payload) and enhancing the accuracy of orientation, stabilization and attitude indication.

The comparative performance of the platforms A and B already developed and of the improved ones being designed is given in the table below.

Analysis of the table shows that both platforms are in keeping with modern trends in building spacecraft for Earth surveillance and can be considered as possible components of an international Earth observation system (EOS).

In this connection, it is useful to build low-cost A-type platforms to carry out global surveillance of the Earth's surface with low and average resolution, while B-type platforms can be used for surveying specific regions with average and high resolution. Such an approach to building a system based on the use of two separate platforms permits more flexible consideration of users' individual requirements in terms of spacial resolution, visibility and periodicity of Earth observation.

Sbr No	Characteristics	A-platform		B-platform	
		Explotation	In design	Developed	In desigh
1	Orbit type/ inclination, degrees	82.5	sunsynchro-nous orbit or-74; 82,5	sunsyn-chronous orbit	sunsynchro-nous orbit
2	Orbit altitude, km	670	670...900	670	670...900
3	Paylcad weight, kg	550	1200	1600	2500
4	Pointing accuracy (standard deviation), angular minutes	45...60	45...60	8	5
5	Attitude indication accuracy (standard deviation), angular minutes	--	2	--	0.5
6	Angular stabilization velocity, degrees per second	0.02	0.005	0.005	0.0001
7	Permissible payload power cosumption - daily average, W - in contact, W	 110-270 1100	 420 1100	 800 3500/3500	 1500-2200 8000/5000
8	Yaw control possibility	no	no	yes	yes
9	Propulsion system for orbit correction	no	no	yes	yes
10	Life time, years	0.5	2	1	3
11	Availability for testing	in use	1993	1992	1995

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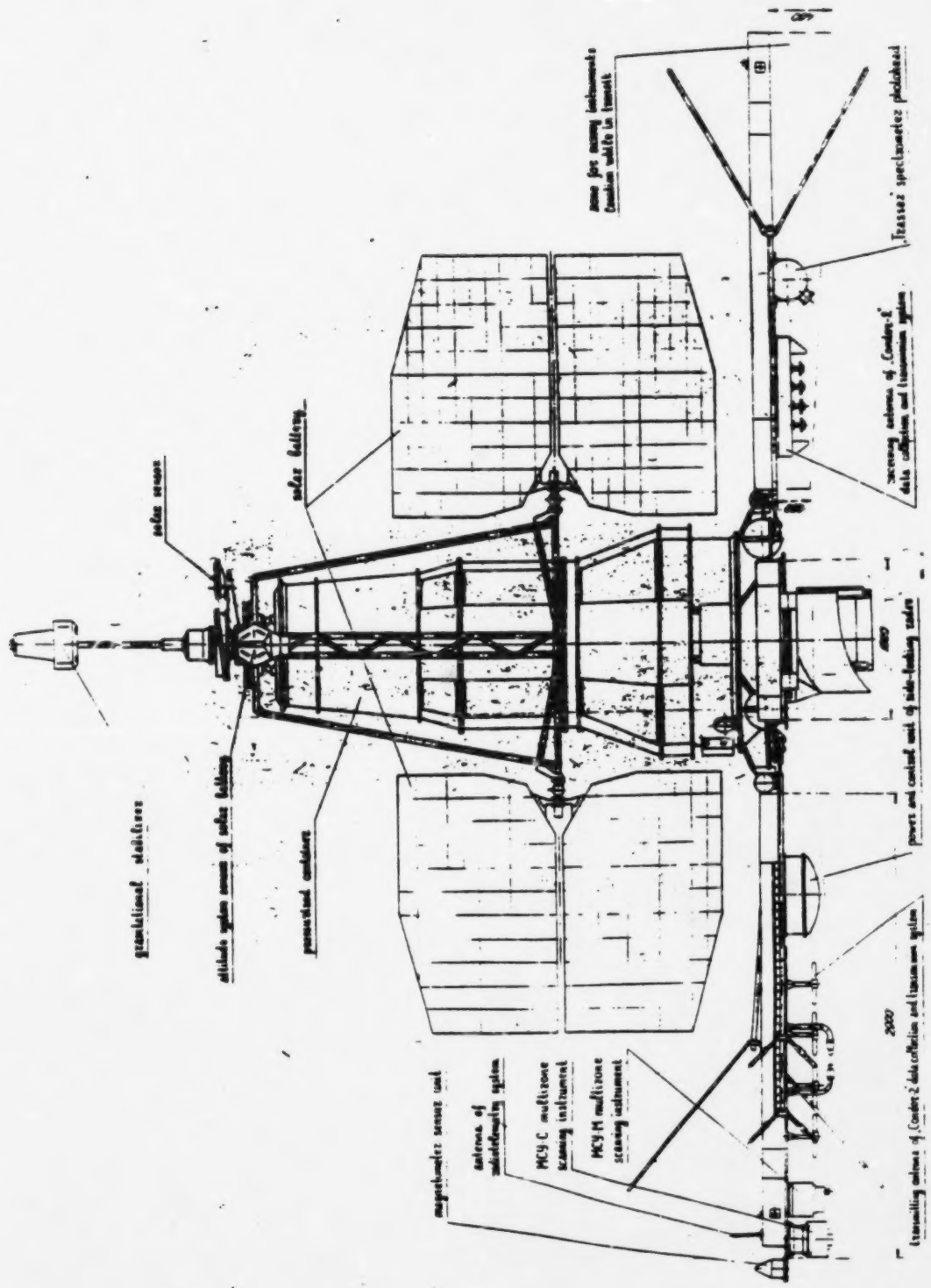
gravitational stabilizer
attitude system sensors of solar battery
solar sensors
pneumatical stabilizer
solar battery
magnetometer sensor unit
antenna of radiotelemetry system
MKS-6 multizone scanning instrument
MKS-M multizone scanning instrument
power and control unit of side-looking radars
Fraunhofer spectrometer photohead

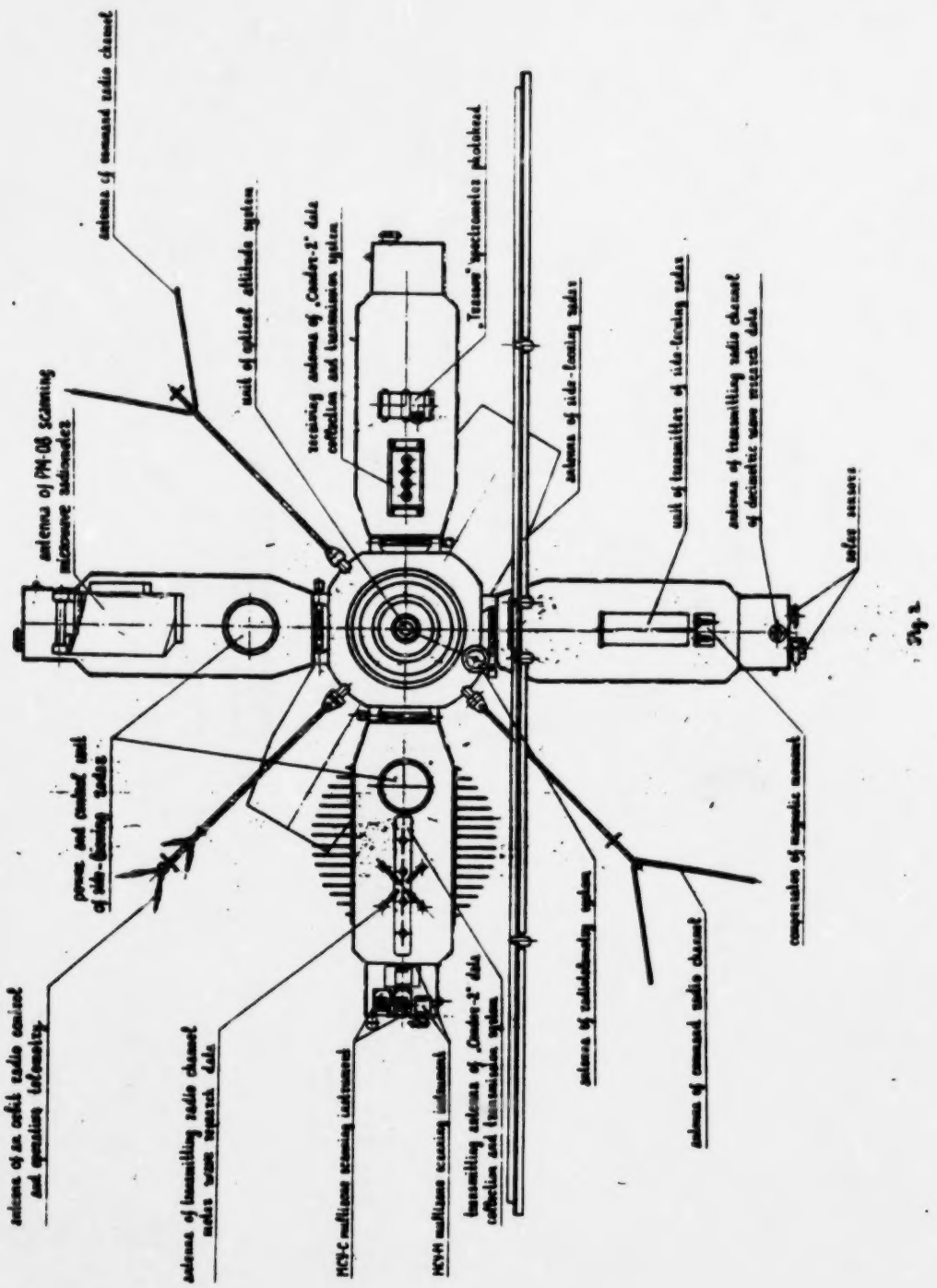
antenna of command radio channel
unit of optical attitude system
receiving antenna of „Condor-2" data collection and transmission system
„Tezisa" spectrometer photometer
antenna of PM-08 scanning microwave radiometer
antenna of side-looking radar
unit of transmitters of side-looking radar
antenna of transmitting radio channel of scientific mass research data
solar sensors
power and control unit of side-looking radar
antenna of an optical radio control and operation telemetry
antenna of transmitting radio channel radio mass research data
MSU-E multizone scanning instrument
MSU-M multizone scanning instrument
transmitting antenna of „Condor-2" data collection and transmission system
antenna of satellitebearing system
antenna of command radio channel
compensator of magnetic moment

Fig. 2

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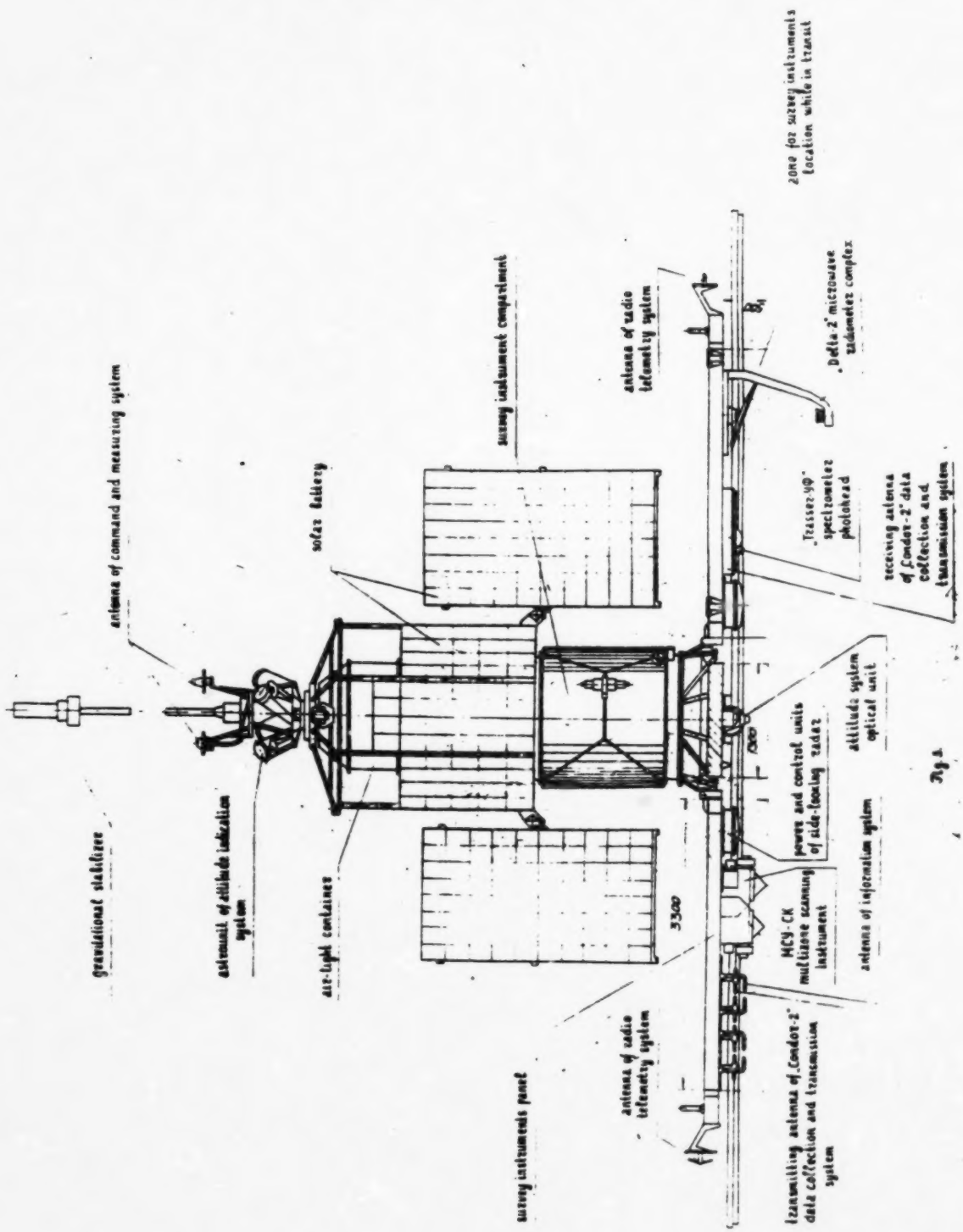
gravitational stabilizer
antenna of command and measuring system
solar battery
survey instrument compartment
antenna of radio telemetry system
zone for survey instruments location while in transit
"Delta-2" microwave radiometer complex
"Trasser-99" spectrometer photohead
receiving antenna of Condor-2" data collection and transmission system
attitude system optical unit
power and control units of side-looking radar
HCV-CK multizone scanning instrument
antenna of injection system
antenna of radio telemetry system
survey instruments panel
transmitting antenna of Condor-2" data collection and transmission system
air-tight container
antennas of attitude indication system
3300
1500

Fig.1

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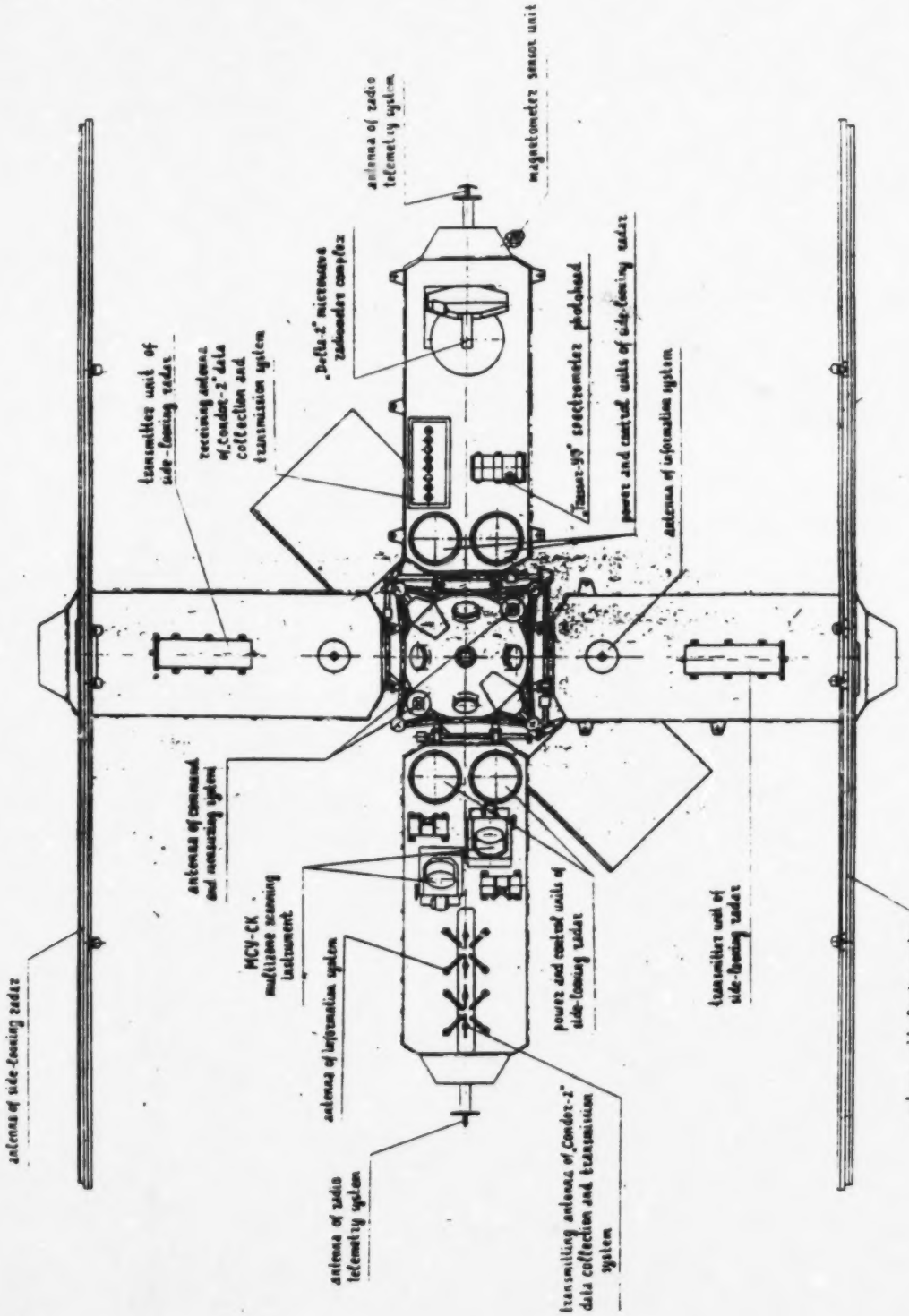
antenna of side-looking radar
antenna of command and measuring system
MSU-SK multizone scanning instrument
antenna of information system
antenna of radio telemetry system
transmitting antenna of „Condor-2" data collection and transmission system
power and control units of side-looking radar
transmitter unit of side-looking radar
antenna side-looking radar
transmitter unit of side-looking radar
receiving antenna of „Condor-2" data collection and transmission system
„Delta-2" microwave radiometer complex
„Tomer-99" spectrometer payload
power and control units of side-looking radar
antenna of information system
antenna of radio telemetry system
magnetometer sensor unit

Fig.

/...

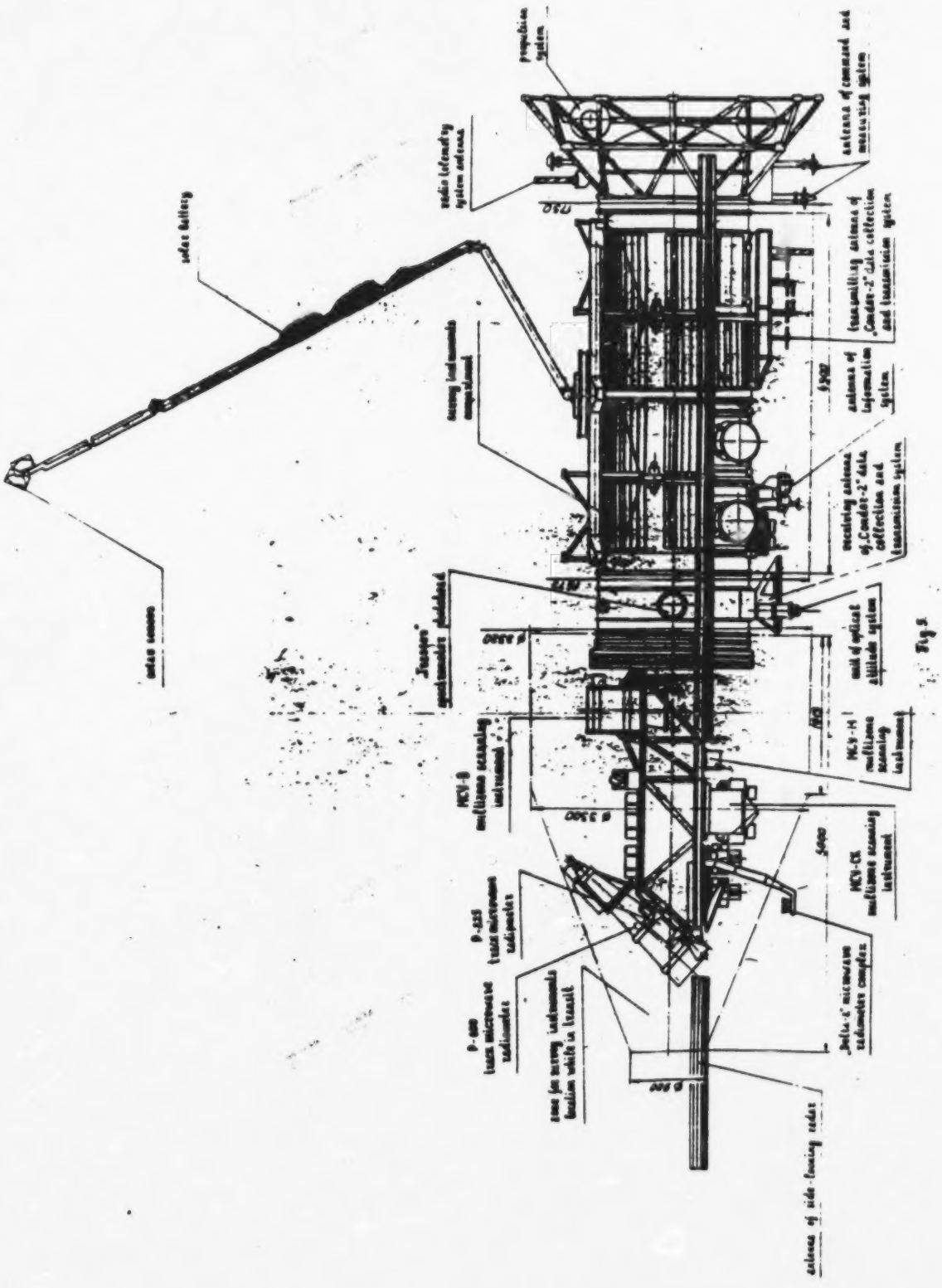

Fig. 1

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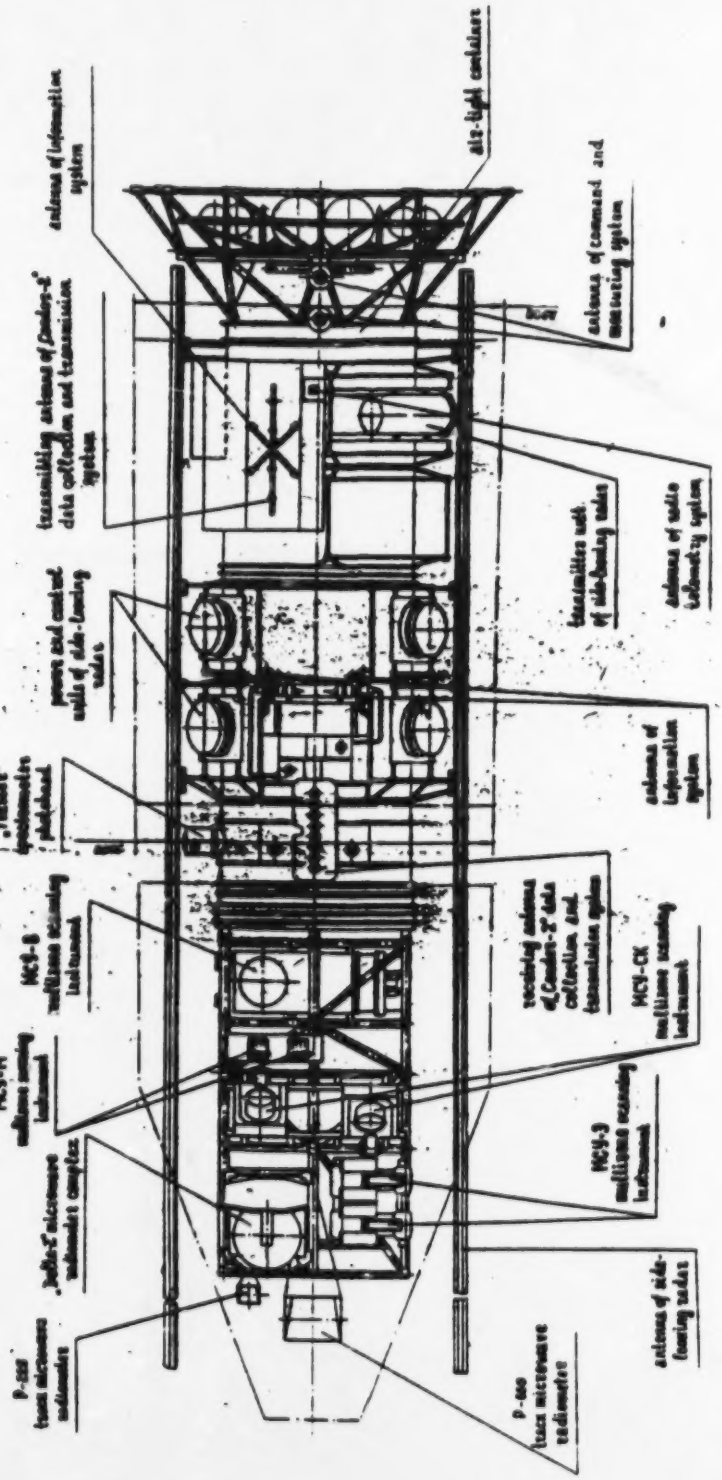
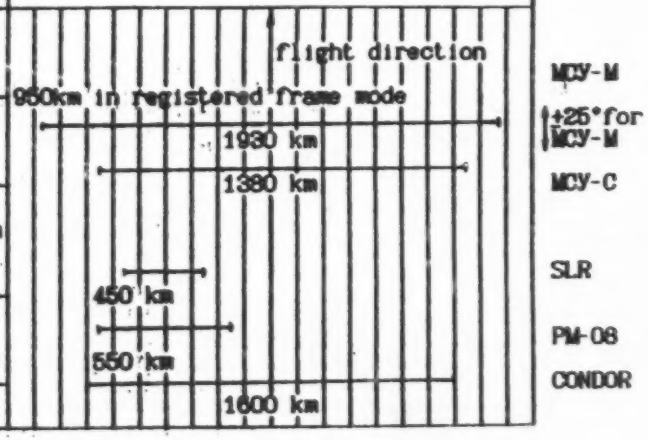

air-light containers
antenna of information system
antenna of command and measuring system
transmitting antenna of „Cosmos-2" data collection and transmission system
power and control units of ship-bearing tubes
transmitting unit of ship-bearing tubes
antenna of radio telemetering system
„Tsiklon" spaceborne navigational complex
antenna of information system
receiving antenna of „Cosmos-2" data collection and transmission system
MCU-8 multiband scanning instrument
MCU-CK multiband scanning instrument
MCU-N multiband scanning instrument
„Delta-2" microwave radiometer complex
MCU-9 multiband scanning instrument
P-600 trace microwave radiometer
antenna of ship-bearing tubes
P-350 trace microwave radiometer

Fig.4

/...

THE "OKEAN" SATELLITE PAYLOAD

Instrumentation	The number of complete set	The number of channels	Spectral band	Spatial resolution	Scanned area
МСУ-М	2	4	0.5-1.1 μm	1x1.7 km	
МСУ-С	2	2	0.5-0.9 μm	350 m	
side-looking radar SLR (РЛС БО)	1	1	3.1 cm	1.8x2.2 km	
РМ-08	1	1	0.8cm	15x15km	
CONDOR-2	1	1			



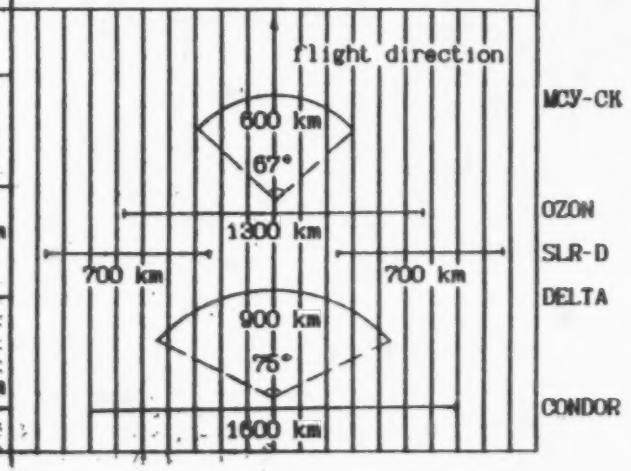
Data transmission radio links

Instrumentation	Radio linkstype type	Frequency	Data transmission rate / frequency band	Storage capasity
"Природа" (Nature) radio television links:				
ДМ -links	analogue	466.5 MHz	20 kHz	operal time 6.5 min
М -links	analogue	137.4 MHz	2 kHz	operal time 6.5 min
CONDOR-2	digital	transmission 460.03 MHz reception 1533.4 MHz	transmission 2 kbit/s reception 500 bit/s	64 Kbit

/...

THE PAYLOAD OF THE A-TYPE PLATFORM

Instru-mentation	The number of complete set	The number of channels	Spectral band	Spatial resolution	Scanned area
МСУ-СК (М)	2	3-visible 3-infrered	0.4-0.7 μm 3.5-12.4 μm	200 m 600 m	
OZON	1	2x8 programmed choice out of 2x1024	0.25-0.4 μm	20 km	
РЛС БО-Д side-looking radar SLT-D	1	2	3.1 cm	1.5x2.0 km	
DELTA-2	1	8	0.8 cm 1.35 cm 2.25 cm 4.3 cm	16x21 km 27x35 km 47x62 km 87x115 km	
CONDOR-2	1				



Data transmission radio links

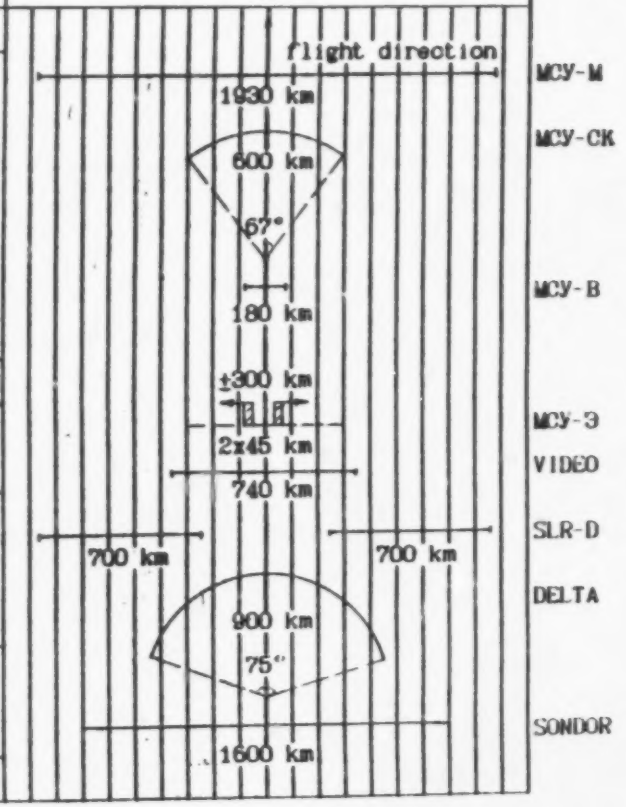
Instrumentation	Radio links type	Frequency	Data transmission rate	Storage capasity
The "KOSPOD" space-based on-line data acquisition, transmission and processing complex	digital digital	1.7 GHz 8.2 GHz	665;960;2560 Kbit/s 15.36 Mbit/s	1.6 GGbit 5.5 GGbit
CONDOR-2	digital	transmission 400.05 MHz reception 1533.4 MHz	2 Kbit/s 500 bit/s	64 Kbit

/...

THE PAYLOAD OF THE B-TYPE PLATFORM (N 1,2)

Instru-mentation	The number of complete set	The number of channels	Spectral band	Spatial resolution
MCY-M	2	4	0.5-1.1 μm	1x1.7 km
MCY-CK	2	2-visible 2-near infra-red 1-infra-red	0.53-0.69μm 0.7 -1.0 μm 10.4-12.6μm	175x245 m 175x245 m 690x820 m
MCY-B	1	3-visible 2-near infra-red 1-medium infra-red 1-medium infra-red 1-infra-red	0.45-0.74μm 0.76-1.1 μm 1.55-1.75μm 2.1 -2.35μm 10.0-12.0μm	50 m 50 m 100 m 250 m 100 m
MCY-3	2	3	0.5-0.9μm	25x35 m
VIDEO (or TRASSER)	1	2x6 programmed choice of 2x256	0.4-0.8	1 km
SLR-D or left(Д) and right(Д) SLRs (side-looking radars)	1	2	3.1 cm	1.5x2.0 km
DELTA-2	1	8	0.8 cm 1.35 cm 2.25 cm 4.3 cm	16x21 km 27x35 km 47x62 km 87x115 km
CONDOR-2				

Scanned area



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Data transmission radio links of the B-type platform

Instrumentation	Radio linkstype type	Frequency	Data transmission rate /frequency / band	Storage capasity
BISU-P on-board information system	digital	8.2 GHz	15.36; 30.72; 61.44 Mbit/s	5.5GGbit
Radio television channel M-link	analogue	137.4 MHz	2 kHz	
CONDOR-2	digital	transmission 460.03 MHz reception 1533.4 MHz	transmission 2 kbit/s reception 500 bit/s	64 Kbit

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UNITED
NATIONS

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General Assembly

Distr.
LIMITED

A/AC.105/L.187
5 June 1990
ENGLISH
ORIGINAL: RUSSIAN

COMMITTEE ON THE PEACEFUL USES
OF OUTER SPACE
Thirty-third session
4-15 June 1990
Agenda item 5

REPORT OF THE SCIENTIFIC AND TECHNICAL SUB-COMMITTEE ON THE WORK OF ITS TWENTY-SEVENTH SESSION

Working paper submitted by the Union of Soviet Socialist Republics

The "Priroda" package for remote sensing of the Earth (international project)

The purpose of this working paper is to draw the attention of international and national organizations involved in remote sensing of the Earth and environmental research to the "Priroda" equipment package planned for launch on one of the modules of the Mir orbital station.

The document describes the instrumentation making up the "Priroda" package and the basic characteristics of the individual instruments. The tasks the package can carry out are lisced. A preliminary list is given of the experiments it is planned to conduct using the equipment in the package.

All interested organizations can obtain supplementary information on the characteristics of the equipment in the "Priroda" package and the capacities of the module and the orbital station from the following address:

Priroda project
Glavkosmos USSR
Krasnoproletarskaya
Moscow USSR
(Telex 411879 SU; Fax: 28859583)

Consideration can also be given to the possibility of transmitting to interested organizations information obtained using the equipment in the package, as well as to their participation in conducting not only the experiments described in the project, but also newly proposed experiments. In addition, proposals are accepted for the installation on board the module of supplementary equipment (up to 1,000 kg mass) for remote sensing and environmental research. These proposals will be reviewed in the light of their scientific and practical value, as well as of the module's capabilities and the timing of the equipment's readiness.

I. GENERAL REMARKS

Observation of the state of land masses, the ocean and the atmosphere, systematic comprehensive monitoring of geophysical parameters on a planet-wide scale and study of their dynamics constitute one of the principal problems of contemporary earth sciences. These activities have a close bearing on the solution of many important questions of geography and geology, oceanology and hydrology, meteorology and weather forecasting, climate studies and ecology. A special role in this respect is played by research into the ocean-atmosphere interaction and study of the mechanisms of the formation of temperature anomalies at the ocean surface and their relationship to heat sources in the atmosphere, as well as study of the large-scale movements in the ocean and the atmosphere related to these anomalies. For study of land masses, importance is attached to monitoring of the state of plant and snow cover, of the soil humidity régime and mineralization and of the signs of various types of pollution of the land surface. Such tasks as identifying regions dangerous for navigation and bioproductivity zones in the ocean, study of the dissemination of anthropogenic aerosol and gas pollutants in the atmosphere, etc., are also of great practical importance.

To solve these and other problems in the natural sciences, systematic data on a global scale are needed about local large-scale processes at the ocean surface, on dry land and in the atmosphere. This information can be obtained by periodic measurement of geophysical parameters, among the most important of which are the ocean surface temperature, wind speed in the surface layer of the atmosphere cloud cover characteristics (water content, stability, temperature of the upper boundary), intensity of precipitation, heat flow at the "ocean-atmosphere" interface, vertical temperature profiles, etc.

Remote sensing of the Earth using artificial satellites is the only means capable of ensuring systematic and global acquisition of scientific information on the state of the seas and oceans, land masses and the atmosphere. However, the possibilities of remote sensing of the Earth from space are far from having been exhausted; existing technical means and methods of measurement need to be improved and developed. In so doing, in order to ensure the necessary accuracy and reliability of measurement, a comprehensive approach needs to be taken to the construction of measurement systems, based on a reasonable combination of active and passive sensing devices which operate over a broad spectral range, from the ultraviolet to the ultra-high frequencies.

At present a number of major projects are being developed which make use of both active and passive means in the visible, infrared and ultra-high-frequency (UHF) ranges. Among these projects is the composite special-purpose international project "Priroda", which it is planned to install in the Mir orbital complex at the beginning of the 1990s. This project is research-oriented. It will permit the development of new methodological and equipment facilities for a comprehensive survey system which will permit the determination, with a high degree of resolution, accuracy and reliability, of various geophysical parameters relevant to the solution of various problems in the national ecoromy that involve investigation of the Earth's natural resources and environment; it will also permit improvements in existing means and methods of remote sensing, including the processing and transmission of scientific information.

At present, six countries - Bulgaria, Czechoslovakia, the German Democratic Republic, Poland, Romania and the USSR - are participating in the Priroda project.

II. EQUIPMENT

The Priroda equipment package offers the possibility of:

(a) Radio-physical investigation of the environment;

(b) Infrared spectroradiometric study of the spatial structure of infrared radiation in the atmosphere;

(c) Spectroradiometric study of reflected solar radiation in the "atmosphere-surface" system in the visible and near infrared ranges.

The package comprises the following equipment:

(a) The Ikar UHF radiometric system, which includes the R-30, R-135, R-225P and RP-600 along-tract polarizing radiometers for nadir measurements ("Ikar-N"), two panoramic units consisting of three RP-225 polarizing radiometers and five RP600 polarizing radiometers operating at an angle of 40° to nadir ("Ikar-11"), the "Delta" set of scanning polarizing radiometers (R-30, R-80, R-135) and the R-400 scanning radiometer, also operating at an angle of 40° to nadir ("Ikar-D");

(b) The "Istok-1" 64-channel infrared spectroradiometric system;

(c) The MOZ-Obzor 17-channel radiometric system for the visible and near infrared ranges;

(d) A television camera (the television camera of the sighting unit in the "Istok-1" system is used);

(e) A two-frequency side-looking radar with a synthetic aperture;

(f) A precision radioaltimeter;

(g) The "Kentavr" system for collecting information from geophysical buoys;

(h) The "Ozon-Mir" spectrometer for atmospheric transparency studies;

(i) The MSU-SK and MSU-E multi-band scanners.

The characteristics of the scientific equipment in the Priroda composite special-purpose international project are given in Table 1.

Apart from the equipment listed above, there are plans for conducting some experiments involving joint studies using the "Alisa" aerosol lidar, developed jointly with French experts.

On board the module, there is also provision for supplementing the Priroda package with additional scientific equipment delivered to the Mir orbital station by a cargo spacecraft. The units housing this equipment can be installed by the operator both within the hermetic compartment of the module (including on the porthole) and outside. For this purpose, the module has been fitted with a so-called multi-purpose work station which comprises housings for the units together with instruments and cables to connect the equipment with the on-board energy supply, control and telemetry systems.

The characteristics of the multi-purpose work station are given in Table 2.

The dimensions of these units of equipment may not exceed 0.6 m x 0.45 m x 1 m; these figures are approximate and need to be specified more precisely in each individual case.

A general view of the module with the remote-sensing equipment is shown in Figure 1.

A schematic diagram of the Mir orbital complex with the remote-sensing module docked to it is shown in Figure 2.

III. PURPOSES OF THE EXPERIMENT

The distinguishing feature of the experiments under the Priroda project is their comprehensive nature, involving joint use of various configurations of active and passive equipment operating over a wide range of wavelengths.

Use of the system of UHF frequency radiometers operating at various polarizations and angles of observation in the short millimetre to centimetre wavelength range affords the possibility of considerably expanding the range of synoptic situations investigated; in particular, it permits investigation of ocean fields with surface wind speeds of up to 10 m/s, which are typical in 70-80 per cent of cases.

Utilization of the UHF radiometric system jointly with the optical range (visible and infra-red) equipment permits a substantial increase in the accuracy of determination of the characteristics of the ocean surface by refining the

atmospheric transmission function, which is determined by the aerosol's optical and spatial characteristics and the phase composition of the cloud particles, as well as in the accuracy of determination of vertical profiles of temperature, humidity, and concentrations of ozone and other minor gaseous constituents of the atmosphere.

Combination of measurements of radiation in the visible, infra-red and UHF ranges of the spectrum affords the possibility of determining the phase composition and altitude of the upper limit of cloud cover.

Joint utilization of passive (UHF radiometers) and active (radar and radioaltimeter) sounding facilities in the radio range permits detailed study of the interaction between the various spectral components of marine wave motion, which is needed in order to study the processes of energy exchange between the atmosphere and the ocean.

As a result of the experiments under the Priroda project:

(a) Improvements and new developments should take place in composite procedures, as well as in equipment for remote determination, with a high level of reliability and accuracy, of characteristics of the ocean and atmosphere and certain hydrological characteristics of land masses in the interests both of the economy and of the solution of various environmental problems. Inter alia, methods have been developed of determining the characteristics of a choppy sea surface and of intra-ocean phenomena, snow and ice cover and various forms of anthropogenic impact;

(b) Concrete data have been obtained on the spatial distribution of parameters of the earth's surface, the ocean and the atmosphere, with various spatial resolutions, in order to investigate the energy exchange between the atmosphere and the ocean in energy-active regions of the earth for the purpose of studying in depth of the physics of the atmospheric processes that determine weather formation in various regions of the world, and to investigate and inventory, agricultural lands, forests, the limits and nature of snow cover, the humidity content of snow, etc.;

(c) Procedures have been developed for joint interpretation of sub-satellite measurements simultaneously with remote satellite measurements;

(d) Methods have been developed for on-board and ground-based processing of large bodies of composite information, and also for rapid transmission of this information to ground stations and users.

IV. PRELIMINARY LIST OF EXPERIMENTS

In the course of work under the Priroda project, it is assumed that the following specific investigations will be conducted.

Experiment to determine the basic characteristics of the "atmosphere-ocean surface" system

This experiment will measure:

(a) Water content, with an accuracy of 0.05-E0.3 e/m^2;

(b) Total water vapour content of the atmosphere, with an accuracy of 0.2-0.4 g/cm^2;

(c) Mean cloud temperature, with an accuracy of 1-2°K;

(d) Precipitation zone boundaries, with an accuracy of 10 km;

(e) Precipitation zones and intensity, with an accuracy of 2-4 gradations.

In addition, the spatial and temporal variability of large-scale temperature fields at the ocean surface is determined (the accuracy of determination of ocean surface temperature is about 1°K, with a spatial resolution of 5-50 km), as well as the characteristics and direction of ocean surface winds (with an accuracy of about 1 m/s and about 1° respectively).

In this experiment, the "Istok-1" infrared spectral radiometric system is used to refine, calibrate and standardize the measurements carried out by the Ikar system, as well as to measure:

(a) The phase composition and upper limit of clouds;

(b) The vertical temperature profiles (with an accuracy of 3-5°K) and concentration of ozone in the atmosphere;

(c) The concentrations and spatial distribution of minor gaseous constituents, including anthropogenic pollutants, in the atmosphere (with an accuracy of 10^{-7} molecules of pollutants/molecules of air; constituents - ozone, nitrous oxide, sulphur dioxide, ammonia, nitric acid).

The MOZ-Obzor visible and near infrared spectrometric system is used in this experiment to refine the measurements of atmospheric parameters conducted by the Ikar and Istok-1 systems, and also to measure (with an accuracy of 5-10 per cent) over specific ocean regions:

(a) The optical characteristics of the atmosphere;

(b) The altitude and nature of cloud cover;

(c) The optical thickness of the atmosphere;

(d) The characteristics and distribution of ozone and anthropogenic pollutants in the atmosphere;

(e) The spectral characteristics and horizontal distribution of natural and anthropogenic formations at the ocean surface.

The television camera is used in this experiment to provide visual images of various parts of the "atmosphere-ocean surface" system, to improve the accuracy of identification of the upper limit of cloud cover and the classification of cloud types, and to refine the ocean surface albedo measurements.

Experiment to measure the character and dynamics of sea waves

The Ikar UHF radiometric system is used to determine the speed and direction of surface winds.

The precision radioaltimeter is used to measure wave height and study the dynamics of changing wave height over selected sections of the sea for subsequent use in refining the procedure for mapping marine wave heights. The stage of wave evolution and its effect on the shape of the reflected impulse are determined from the combined precision radioaltimeter and UHF radiometer data. Initial classification of sea waves and assessment of the variability of the atmosphere over the surface track of the measurements are performed using the Obzor visible and near infrared system. The nature of the wave motion is identified more precisely using the television camera. Comparison of the data from the measurements with data from surface stations makes it possible to determine the accuracy with which the precision radioaltimeter determines wave height.

Experiment to investigate subsurface phenomena in the ocean and characteristics of the earth's land surface

The set of UHF radiometers is used to determine internal waves in the ocean and the variation in surface and gravity/capillary waves, as well as the humidity of the earth's land surface. Simultaneously, the synthetic-aperture side-looking radar measures the same characteristics, and also permits definition of the boundaries of snow cover on land. The television camera provides simultaneous visual images of the surface areas being studied.

The side-looking radar and the UHF radiometers are used jointly, with identical coverage, for cluster analysis to determine the state of ice cover and the characteristics of sea wave motion.

Experiment to compare the radiative and reflective characteristics of the sea surface in the UHF range

The RP-225 and R-600 radiometers are used to determine the radio-brightness (radiative) characteristics of the sea surface. The synthetic-aperture side-looking radar and the television camera are used to determine the reflective characteristics of the sea surface.

Experiment to measure local characteristics of the earth's land surface

The following local characteristics of the land surface are measures:

(a) Humidity;

(b) The state and nature of agricultural holdings and forests;

(c) The limits and nature of snow and ice;

(d) Sources of precipitation;

(e) The dynamics of cyclone development.

The studies are conducted using the high-resolution UHF scanning radiometers (the "Delta" unit, the side-looking radar and the Istok-1 system.

The television camera permits determination of the nature and type of land surface and of snow and ice cover and their limits.

Experiments to measure the content of minor gaseous admixtures in the atmosphere (Istok-1 régime)

The Istok-1 infrared spectroradiometric system is used for global mapping of concentrations and measurement of the vertical profiles of concentrations of minor gaseous constituents in the atmosphere, including anthropogenic pollutants (accuracy of measurement 10^{-7} per cent).

The experiments are conducted over fixed selected regions.

Experiments to measure the optical characteristics of the atmosphere and the Earth's surface (Obzor régime)

The Obzor spectrometric system for the visible and near infrared range is used in this experiment to measure (with an accuracy of 5-10 per cent) the following characteristics of the atmosphere and the Earth's surface:

(a) Optical thickness;

(b) Scattering index;

(c) Spectral brightness co-efficients;

(d) The optical characteristics of clouds (altitude, optical thickness, solar radiation absorption co-efficient).

The experiments are conducted over selected sections of the Earth's surface.

Experiment to determine minor gaseous and aerosol constituents of the atmosphere

The investigations are conducted using the Istok-1, Obzor and Ozon-Mir spectrometric systems.

The following are measured in the course of the experiment:

(a) The absorption spectra of the atmosphere at sunset;

(b) The spectra of reflected solar radiation;

(c) The vertical profiles of thermal radiation.

The purpose of the experiment is to investigate the distribution of ozone, nitrogen dioxide and other minor gaseous and aerosol constituents of the atmosphere.

The Ozon-Mir spectrometer is used in this experiment to measure the profiles of minor gaseous and aerosol constituents with good vertical spatial resolution. The Istok-1 and Obzor systems are used to refine the results of these measurements, affording a substantial improvement in horizontal spatial resolution of the minor gas and aerosol constituent profiles.

The experiments are conducted over selected sections of the Earth's surface.

The broad range of equipment in the Priroda package and the possibility of using it in any configuration permit the conduct of a large number of supplementary experiments in implementation of various scientific programmes on the development of procedures for remote determination of the characteristics of the atmosphere and of the surface beneath it and the dynamics of changes in them in response to human impact.

The growing impact of man on the environment and his increasing energy capabilities call for close attention to, and constant monitoring and forecasting of, man's impact on nature. The human environment is becoming increasingly sensitive to the aggressive nature of man's daily activities, and it is foreseeable that the interaction between man and the environment may advance from the stage of adaptation and of compensable changes in the environment to the stage of uncontrollable, unpredictable and often catastrophic consequences.

The Priroda international project is one of the first attempts at a comprehensive remote-sensing approach to study of the environment and the consequences of man's interaction with it. The development of procedures and equipment for remote investigations and world-wide monitoring of the characteristics of the atmosphere and the surface beneath it and the impact of man's activities on them will subsequently make it possible to develop a global international system for monitoring and forecasting anthropogenic impacts on the environment - a global environmental monitoring system.

COMPOSITION AND CHARACTERISTICS OF EQUIPEMENT OF PROJECT "PRIRODA"

Table 1

Name of Instrumentation	Weight kg	Power W	Wave-lenght sm	Pattern: degree	Fluctuation: sensitivity K	Space resolution, km (h=400km)	Informations content kbit/s	Looking band km (h=400km)	Angle of observation: degree	Creator
1	2	3	4	5	6	7	8	9	10	11	12
I. Microwave radiometric system IKAR											
1. Nadir looking radiometers ("IKAR-N")	70	130	-	-	-	-	0,4	-	-	USSR
R-30	-	-	0.3	9.0	0.15	60	-	60	0	
R-80 (trace)	-	-	0.8	9.0	0.15	60	-	60	0	
R-135 (trace)	-	-	1.35	9.0	0.15	60	-	60	0	
R-225P (trace)	-	-	2.25	9.0	0.10	60	-	60	0	
RP-600 (trace)	-	-	6.0	9.0	0.15	60	-	60	0	
2. Scanning radiometer unit (IKAR-D) "Delta"	50	100	-	-	-	-	8.0	400	40	USSR
R-30	-	-	0.3	1.0	1.5	5	-	-	-	
R-80	-	-	0.8	1.5	0.5	8	-	-	-	
R-135	-	-	1.35	2.0	0.4	15	-	-	-	
3. RP-225 (panoramic "IKAR-P")	20	40	2.25	12	0.15	75	0.1	750	40	3
4. R-400 (scanning "IKAR-D")	35	30	4.0	5-7	0.15	50	0.2	700	40	USSR
5. RP-600 (panoramic "IKAR-P")	20	30	6.0	12	0.15	75	0.3	750	40	Bulgaria 5 USSR
II. IK spectroradiometric system "Istok-1"											
6. "Istok-1"	100	100	4.0-16.0 mkm (64 channels)	12x48	0.2	0.7x2.8 (3.5 km gradient)	0.8	6	0-90 in plane of orbit 0-90 to plane of orbit	USSR Poland Romania Czecho-slovakia

Table 1 goes on

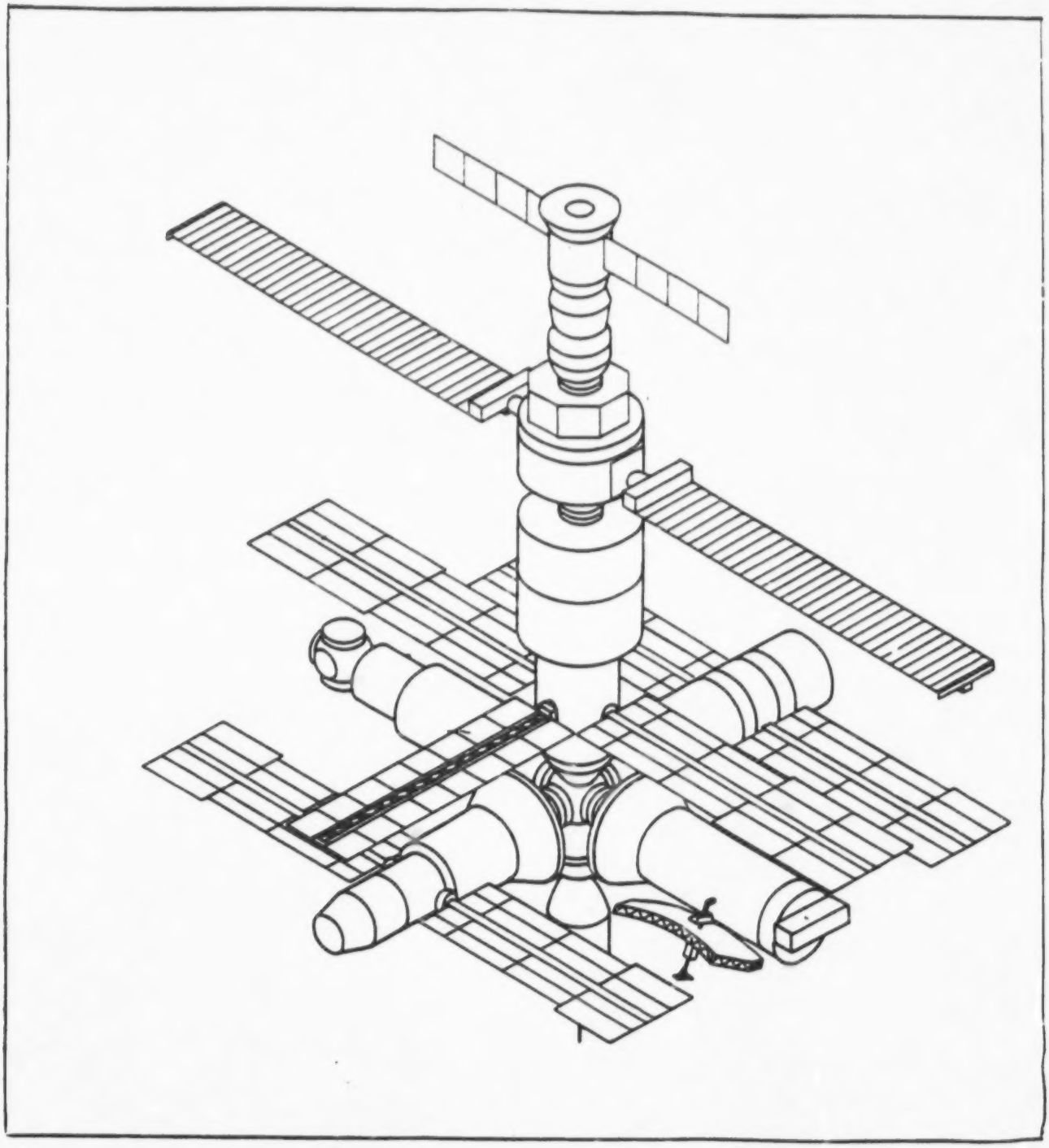
1:	2	3	4	5	6	7	8	9	10	11	12
				III. Spectrometric systems in visible and nearest IR range							
7.	"MOS-OBZOR"	120	220	0.415-1.03 mkm (17 channels)	-	-	0.6	16/256	60	0	USSR GDR
8.	MSU-SK	56	300	0.5-12.5 mkm (5 bands)	-	0.5	120-300 m	11.5 mbytes/s	350	39	USSR
9.	MSU-E	27	150	0.5-0.9 mkm (3 bands)	-	0.5	25 m	11.5 mbytes/s	27+27	0	USSR
				IV. Television camera							
10.	TV	3	5	0.4-0.75 mkm	15	0.5	0.3	6.5	90	0	From system "Istok1",PR
				V. Precise radioaltimetre							
11.	"Greben"	90	450	2.25	1.5	-	0.1-0.15	8.0	2	0	USSR
				VI. S A R							
12.	"Travers"	470	750x2	9.2 23	1x4 2.5x4	-	0.1-0.15	-	70-100	30-40	USSR
				VII. Data acquisition system from geographical buoys							
13.	"Kentavr"	7	2	401.5 MHz	5	-130 dB	-	1024	-	-	USSR Transmitter 7-10 W
				VIII. Equipement for measuring ozone and aerosol concentrations profile							
14.	"Ozone-M"	70	200	0.26-1.02	-	-	1	50 altitude	-	-	USSR
15.	"Alisa"	250	2650	527 nm	3'	-	150 m	33	-	-	

/...

Table 2

Parameters of the Universal Work Place

No.	Parameter	For all delivered scientific equipment	For delivered scientific equipment outside hermetic compartment
1	Mass, kg	Up to 1,000	Up to 200
2.	Power supply, W	1,000	500
3.	Number of power feeders	3	3
4.	Number of commands	44	44
5.	Synchronous pulse marks	Yes	Yes
6.	Number of parameters telemetered	46	46
7.	Number of channels for digital data transmission (f = 1.3 MHz)	2	2



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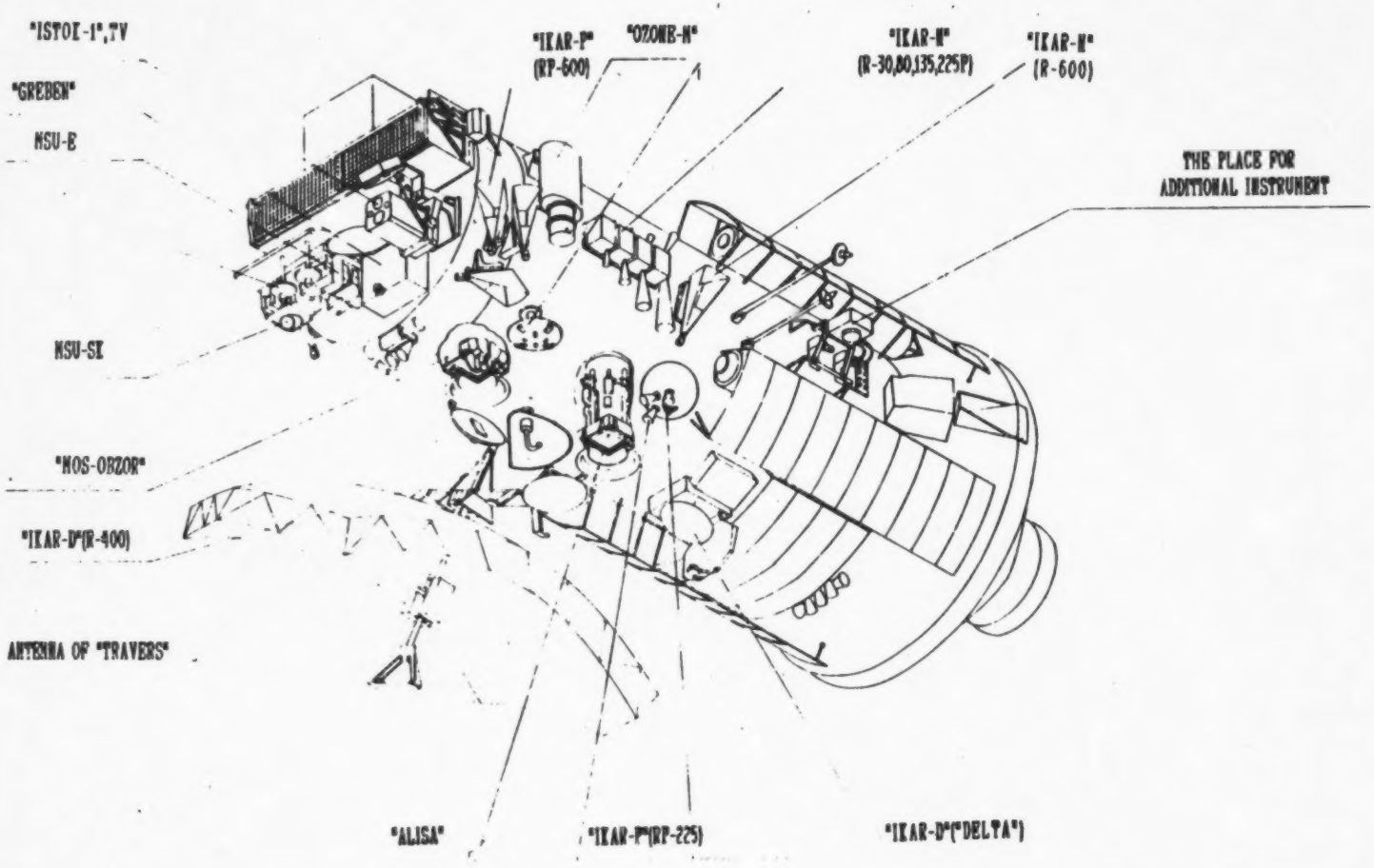
MODULE "PRIRODA" WITH THE REMOTE SENSING INSTRUMENTS



UNITED
NATIONS

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General Assembly

Distr.
LIMITED

A/AC.105/L.188
11 June 1990

ORIGINAL: ENGLISH

COMMITTEE ON THE PEACEFUL USES
OF OUTER SPACE

DRAFT REPORT ON THE WORK OF THE THIRTY-THIRD SESSION

I. INTRODUCTION

1. The Committee on the Peaceful Uses of Outer Space held its thirty-third session at United Nations Headquarters from 4 to 15 June 1990. The officers of the Committee were the following:

Chairman: Mr. Peter Jankowitsch (Austria)

Vice-Chairman: Mr. Aurel Dragos Munteanu (Romania)

Rapporteur: Mr. Flavio Miragaia Perri (Brazil)

The verbatim records of the Committee's meetings are contained in documents A/AC.105/PV.336-....

Meetings of subsidiary bodies

2. The Scientific and Technical Sub-Committee held its twenty-seventh session at United Nations Headquarters from 26 February to 9 March 1990 under the chairmanship of Mr. John H. Carver (Australia). The report of the Sub-Committee was issued as document A/AC.105/456.

3. The Legal Sub-Committee held its twenty-ninth session at the United Nations Office at Geneva from 2 to 20 April 1990, under the chairmanship of Mr. Václav Mikulka (Czechoslovakia). The report of the Sub-Committee was issued as document A/AC.105/457. The summary records of the Sub-Committee's meetings are contained in documents A/AC.105/C.2/SR.527-538.

4. At its opening meeting, the Committee adopted the following agenda:

1. Adoption of the agenda.

2. Statement by the Chairman.

3. General exchange of views.

4. Ways and means of maintaining outer space for peaceful purposes.

5. Report of the Scientific and Technical Sub-Committee on the work of its twenty-seventh session.

6. Report of the Legal Sub-Committee on the work of its twenty-ninth session.

7. Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space.

8. Spin-off benefits of space technology: review of current status.

9. Other matters.

10. Report of the Committee to the General Assembly.

Membership and attendance

5. In accordance with General Assembly resolutions 1721 E (XVI) of 20 December 1961, 3182 (XXVIII) of 18 December 1973, 32/196 B of 20 December 1977 and 35/16 of 3 November 1980, the Committee on the Peaceful Uses of Outer Space was composed of the following Member States: Albania, Argentina, Australia, Austria, Belgium, Benin, Brazil, Bulgaria, Burkina Faso, Cameroon, Canada, Chad, Chile, China, Colombia, Czechoslovakia, Ecuador, Egypt, France, German Democratic Republic, Germany, Federal Republic of, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Kenya, Lebanon, Mexico, Mongolia, Morocco, Netherlands, Niger, Nigeria, Pakistan, Philippines, Poland, Portugal, Romania, Sierra Leone, Sudan, Sweden, Syrian Arab Republic, Turkey, Union of Soviet Socialist Republics, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, Venezuela, Viet Nam and Yugoslavia.

6. At its 336th, 337th, 338th and 432nd meetings, the Committee decided to invite, at their request, the representatives of Bolivia, Costa Rica, Cuba, Greece, the Libyan Arab Jamahiriya, Malaysia, Peru, Spain, Switzerland and the Holy See to attend the thirty-third session of the Committee and to address it, as appropriate, on the understanding that this would be without prejudice to further requests of this nature and that it would not involve any decision of the Committee concerning status.

7. Representatives of the International Atomic Energy Agency (IAEA), the Office of the United Nations Disaster Relief Co-ordinator (UNDRO), the Food and Agriculture Organization of the United Nations (FAO), the International Telecommunication Union (ITU) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) also attended the session.

8. Representatives of the European Space Agency (ESA), the Committee on Space Research (COSPAR) of the International Council of Scientific Unions (ICSU), the International Astronautical Federation (IAF) and the International Telecommunications Satellite Organization (INTELSAT) also attended the session.

9. A list of representatives attending the session is contained in document A/AC.105/XXXIII/INF/1.

Commemorations

10. The Committee took note of the thirtieth anniversary of the launching by the United States of the first meteorological satellite and the twentieth anniversary of the launch of the first Chinese satellite.

Proceedings

11. At the opening of the session, at the 336th meeting, the Chairman of the Committee made a statement reviewing the work of the Committee's subsidiary bodies and outlining the work of the Committee. He reviewed the scientific and technological advances achieved in the field of peaceful exploration of outer space in the past year and called upon the Committee to consider what further contributions of its own it might make towards the strengthening of international co-operation. The text of the Chairman's statement is annexed to the present report.

12. Having been informed that the Committee's Vice-Chairman, Mr. Petre Tanasie, had been assigned to a new post, the Committee, at its 336th meeting, elected Mr. Aurel Dragos Munteanu as its new Vice-Chairman.

13. At the 336th meeting, the Chief of the Outer Space Affairs Division of the Secretariat made a statement reviewing the work of the Division during the previous year.

14. At its 336th to 340th meetings, from 4 to 6 June 1990, the Committee held a general exchange of views, in the course of which statements were made by the representatives of Argentina, Austria, Brazil, Bulgaria, Canada, Chile, China, Colombia, Cuba, Czechoslovakia, Egypt, France, the German Democratic Republic, Germany, Federal Republic of, India, Indonesia, Japan, Mexico, Mongolia, the Netherlands, Nigeria, Pakistan, the Philippines, Sweden, the Union of Soviet Socialist Republics, the United Kingdom of Great Britain and Northern Ireland, the United States of America and Yugoslavia (see A/AC.105/PV.336-340).

15. The representatives of UNDRO, ITU, ESA, INTELSAT, COSPAR and IAF, as well as the United Nations Expert on Space Applications, also made statements (see A/AC.105/PV.336-338 and 343).

16. During the session, special presentations were made by: Mr. Yuri P. Kiyenko, Committee on Geodesy and Cartography, USSR, on "Remote sensing for studying and mapping the natural and economic potential of the USSR"; Mr. Yuri N. Koptev, Ministry of General Machinery, USSR, on "Exploration of the natural resources of

the Earth and ecological studies on board the Mir Orbital Station"; Mr. Charles P. Williams, Earth Observation Satellite Company (EOSAT), United States, on "Status of the Landsat programme"; Mr. Gerard Brachet, Spot-Image, France, on "Applications of the Spot satellite in the service of development"; Mr. M. G. Chandrasekhar, Indian Space Research Organization, India, on "The Indian Remote Sensing (IRS) Satellite Programme"; Mr. Russell Koffler, National Oceanic and Atmospheric Administration (NOAA), United States, on "The thirty-year anniversary of environmental satellites"; and Mr. Leonard A. Ault, Office of Commercial Programs, National Aeronautics and Space Administration (NASA), United States, on "Spin-off benefits of space technology".

17. After considering the various items before it, the Committee, at its ...th meeting, on 14 June 1990, adopted its report to the General Assembly containing the recommendations and decisions set out in the paragraphs below.

UNITED
NATIONS

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General Assembly

Distr.
LIMITED

A/AC.105/L.188/Add.1
11 June 1990

ORIGINAL: ENGLISH

COMMITTEE ON THE PEACEFUL USES OF
OUTER SPACE

DRAFT REPORT ON THE WORK OF THE THIRTY-THIRD SESSION

II. RECOMMENDATIONS AND DECISIONS

A. Ways and means of maintaining outer space for peaceful purposes (agenda item 4)

1. In accordance with paragraph 26 of General Assembly resolution 44/46 of 8 December 1989, the Committee continued its consideration, as a matter of priority, of ways and means of maintaining outer space for peaceful purposes.

2. The Committee was of the view that the General Assembly's request, contained in paragraph 26 of its resolution 44/46, to the Committee on the Peaceful Uses of Outer Space to consider, as a matter of priority, ways and means of maintaining outer space for peaceful purposes and to report thereon, showed the concern felt by the international community and the need to promote international co-operation in the peaceful uses of outer space, taking into account the needs of the developing countries. The Committee, through its work in the scientific, technical and legal fields, had an important role to play in assuring that outer space was maintained for peaceful purposes. It was the firm belief of the members of the Committee that developments that would strengthen the role of the Committee in maintaining outer space for peaceful purposes should continue. The Committee had responsibilities relating to the strengthening of the international basis for the peaceful exploration and uses of outer space. This could cover, among other matters, further development of international space law, including, as appropriate, the preparation of international agreements governing various practical peaceful applications of the achievements of space science and technology. Strengthening international co-operation in the peaceful exploration and uses of outer space also implied the need for the Committee itself to improve, whenever necessary, the methods and forms of its work.

3. Some delegations expressed the view that the Committee should complement the work being done in bilateral and multilateral forums towards preventing an extension of the arms race into outer space and could provide substantive

input to the discussions and negotiations in the Conference on Disarmament. They also expressed the view that the Committee should be kept informed as to the progress made by the Conference on questions related to preventing an extension of the arms race into outer space and that working contacts should be established between the two bodies. They further expressed the view that the peaceful uses of outer space were inseparably linked to the non-peaceful uses, and that promoting and strengthening the peaceful uses of outer space required effective measures to prevent an extension of the arms race into outer space.

4. Other delegations expressed the view that disarmament questions did not fall within the competence of the Committee. They pointed out that the question of the prevention of an arms race in outer space was within the exclusive competence of the First Committee of the General Assembly and of the Conference on Disarmament. Some of those delegations expressed the view that the Committee should avoid extraneous and divisive topics such as disarmament and concentrate on strengthening the scientific and technical content of its work and on efforts to broaden and deepen co-operation by all countries in outer space activities. Examples of such efforts cited included International Space Year, the COSPAS/SARSAT programme and the follow-up to the regional space conference hosted by Costa Rica.

5. Some delegations noted that a number of proposals had been made with a view to promoting broad international co-operation for maintaining outer space for peaceful purposes. Those proposals included the establishment of a world space organization; a ban on the stationing of weapons in outer space; unilateral commitments not to place weapons in outer space; a ban on the use of force in outer space or from space to the Earth; the organization, under an "open skies" policy, of a system for monitoring space activities to ensure that outer space was used for exlusively peaceful purposes; and a "Mission to Planet Mars", possibly with a role for the United Nations.

6. Some delegations reiterated the view that the best way for the Committee to contribute to maintaining outer space for peaceful purposes was to promote international co-operation further by revitalizing its work and that of its sub-committees. In that connection they proposed the establishment of a working group under the item to explore ways to make the work of the Committee and its sub-committees more effective.

7. Some delegations expressed the view that the Committee should reflect only consensus wording on this question in its report. Other delegations expressed the view that that the report should also reflect the differing views and proposals made during the discussions under the item.

UNITED
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General Assembly

Distr.
LIMITED

A/AC.105/L.188/Add.2
12 June 1990

ORIGINAL: ENGLISH

COMMITTEE ON THE PEACEFUL USES
OF OUTER SPACE

DRAFT REPORT ON THE WORK OF THE THIRTY-THIRD SESSION

Addendum

B. Report of the Scientific and Technical Sub-Committee on the work of its twenty-seventh session

Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (agenda items 5 and 7)

1. The Committee considered together agenda items 5 and 7, entitled "Report of the Scientific and Technical Sub-Committee on the work of its twenty-seventh session" and "Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space" (UNISPACE 82), respectively.

2. The Committee took note with appreciation of the report of the Scientific and Technical Sub-Committee on the work of its twenty-seventh session (A/AC.105/456), covering the results of its deliberations on the items assigned to it by the General Assembly in its resolution 44/46.

1. Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space

(a) Working Group of the Whole

3. The Committee noted with satisfaction that, in accordance with resolution 44/46, the Sub-Committee had given priority consideration to the item entitled "Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space" and had re-established the Working Group of the Whole to evaluate the implementation of the recommendations of UNISPACE 82 1/ under the chairmanship of Mr. Raimundo Gonzáles (Chile).

4. The Committee noted with satisfaction that the preparation of certain reports on subjects of relevance to the recommendations of UNISPACE 82 had been undertaken pursuant to the recommendations of the Working Group of the Whole made at its third session held in 1989 and as endorsed by the General Assembly in its resolution 44/46, paragraph 11. The Committee also noted that further studies and reports would be undertaken to implement the recommendations that had been made by the Working Group of the Whole at its fourth session, held in 1990.

5. The Committee noted that the Working Group of the Whole had reviewed the implementation of the recommendations of UNISPACE 82, had concluded that many of the recommendations had still not been fully implemented, and had made a number of recommendations concerning the implementation of the UNISPACE 82 recommendations. The Committee endorsed the recommendations of the Working Group of the Whole, as contained in its report (A/AC.105/456, annex II).

6. The Committee recommended that the Working Group of the Whole should be reconvened during the next session of the Scientific and Technical Sub-Committee to continue its work.

7. The Committee, while expressing its appreciation to all Governments that had made or had expressed their intention of making, contributions for the implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, took note of the disappointment expressed by the developing countries at the lack of financial resources to fully implement those recommendations.

(b) United Nations Programme on Space Applications

8. At the outset of the Committee's deliberations on this item, the United Nations Expert on Space Applications reviewed the activities carried out and planned under the Programme on Space Applications during the period 1989-1991. The Committee expressed its appreciation to the Expert for the effective manner in which he had implemented the Programme within the limited funds at his disposal.

9. Some delegations drew the Committee's attention to the limited economic resources available to the Programme and therefore requested that the financial resources be increased so that the Programme's activities could be implemented.

10. The Committee took note of the Programme on Space Applications, as set out in the report of the Sub-Committee. The Committee was pleased to note that further progress was being made in the implementation of the Programme activities planned for 1990.

(i) Long-range fellowships for in-depth training

11. The Committee expressed its appreciation to the Governments of Austria, Brazil, the German Democratic Republic and the Union of Soviet Socialist Republics, as well as to ESA, for offering fellowships through the United Nations in 1989-1990 and for renewing their offers of fellowships for 1990-1991. The Committee also expressed its appreciation to the USSR for offering additional fellowships for 1990-1991, and to China for offering fellowships for 1990-1991.

(ii) Technical advisory services

12. The Committee noted that the Programme was providing technical advisory services to the Indian Ocean Marine Affairs Co-operation (IOMAC) Programme for the planning of oceanographic and marine affairs pilot projects to be carried out with financial support from the United Nations Development Programme (UNDP) and technical support from the Government of France; to Member States on the Atlantic Coast of Africa for planning remote sensing applications to marine resources and coastal management; to the Economic Commission for Africa (ECA) for evaluating the remote sensing programme of the Regional Centre for Services in Surveying, Mapping and Remote Sensing in Nairobi; and to the Government of Costa Rica for the preparation of the Space Conference of the Americas: Prospects of Co-operation for Development, and for follow-up activities to the Conference. The Committee also noted that, in co-operation with the United Nations, ESA would be providing remote sensing satellite data sets for selected countries in North Africa and West Africa.

(iii) United Nations workshops/training courses/seminars/meetings of experts

13. Regarding the United Nations workshops, training courses and meetings of experts for 1990, the Committee expressed its appreciation to:

(a) The Government of Cuba for co-sponsoring the United Nations Workshop on Space Communications for Development for the benefit of Member States in the region of the Economic Commission for Latin America and the Carribbean (ECLAC);

(b) The Government of Sweden for co-sponsoring the United Nations/Sweden Training Course on Remote Sensing Education for Educators for the benefit of Member States in the ECA region;

(c) The Government of France and to ESA as well as FAO for co-sponsoring the International Workshop on Remote Sensing and Geo-information Technology for Decision Makers;

(d) The Government of Brazil and ESA as well as FAO for co-sponsoring the Second United Nations/FAO/ESA Workshop on Microwave Remote Sensing Technology for the benefit of Member States in the ECLAC region;

(e) The Government of Czechoslovakia as well as FAO for co-sponsoring the United Nations/FAO International Training Course on Agricultural Applications of Remote Sensing.

14. The Committee endorsed the programme of United Nations workshops, training courses, seminars and meetings of experts proposed for 1991 as outlined by the Expert in his report (see A/AC.105/446, para. 32) and recommended those activities for approval by the General Assembly. In so doing, the Committee welcomed the invitations from:

(a) The Government of China to host and co-sponsor the United Nations Workshop on Space Technology Applications to Minimize and Alleviate the Impact of Natural Disasters for the benefit of States members in the region of the Economic and Social Commission for Asia and the Pacific (ESCAP);

(b) The Government of Italy to co-sponsor the XVth UN/FAO International Training Course on Remote Sensing Applications;

(c) The Government of India to host and co-sponsor the United Nations Workshop on Basic Space Research for the benefit of developing countries;

(d) The Government of the United States to host and co-sponsor the International Training Course on Remote Sensing Applications for Environmental Assessment and Monitoring for the benefit of developing countries;

(e) The European Space Agency to co-sponsor the Third United Nations/ESA Workshop on Microwave Remote Sensing Technology for the benefit of Member States in the ECA region, and the Sixth United Nations/FAO/World Meteorological Organization (WMO)/ESA Training Course on Remote Sensing Technology for Development for the benefit of Member States in the ECLAC region.

The Committee further noted with appreciation the contributions of ESCAP, FAO and WMO to those activities.

15. The Committee noted with appreciation the financial and other assistance provided and being offered during the period 1989-1991 by the Governments of Australia, Austria, Brazil, Cuba, Czechoslovakia, France, the German Democratic Republic, Italy, Nigeria, Pakistan, Spain, Sweden, the USSR, the United Kingdom and the United States, as well as by ESCAP, FAO, UNDP, UNESCO, WMO and ESA in connection with the workshops, training courses and meetings of experts. The Committee also noted with appreciation the financial contributions of $10,000 from the Government of Austria, $5,000 from the Government of Nigeria, and $15,000 from the Government of Pakistan in support of the 1989 activities of the Programme on Space Applications, and the contribution of $12,000 from the Government of Pakistan in support of the 1990 activities.

(iv) Promotion of greater co-operation in space science and technology

16. Regarding the promotion of greater co-operation in space science and technology, the Committee noted with satisfaction that the United Nations Programme on Space Applications in 1989 had collaborated with IAF by co-sponsoring a special session on "Space and flood management" during the fortieth IAF Congress, held in Spain, and with the Space Institute of the University of Tennessee in an international symposium on "Space commercialization: roles of developing countries", held at Nashville, Tennessee, United States. The Committee further noted that the Programme was planning future collaboration with COSPAR by co-sponsoring a scientific panel on "The equatorial electrojet and related phenomena" during COSPAR's 1990 Plenary Meeting at The Hague, and with IAF by co-sponsoring a special session on "Space and forest management" during the 1990 IAF Congress at Dresden, German Democratic Republic and a workshop for the benefit

of developing countries in association with the 1991 IAF Congress at Montreal, Canada. The Committee also noted the collaboration of the Programme with the International Society for Photogrammetry and Remote Sensing (ISPRS) and the Sociedad de Especialistas Latinoamericanos en Percepción Remota (SELPER).

(c) International space information service

17. With regard to the International Space Information Service, the Committee noted with satisfaction the publication of: Seminars of the United Nations Programme on Space Applications (A/AC.105/443), containing selected papers from the seminars, workshops and training courses of the Programme; a bibliography on space technology applications to marine resources as part of the assistance provided to IOMAC; an addendum to Education, Training, Research and Fellowship Opportunities in Space Science and Technology and its Applications: A Directory (A/AC.105/432/Add.1); a summary of the scientific and technical presentations made during the twenty-seventh session of the Scientific and Technical Sub-Committee (A/AC.105/459); and a list of experts in space technology and applications (A/AC.105/460). The Committee noted that those publications would be updated as necessary.

(d) Co-ordination of space activities within the United Nations system and inter-agency co-operation

18. With regard to co-ordination of outer space activities within the United Nations system and inter-agency co-operation, the Committee noted the request of the General Assembly, contained in its resolution 44/46, to all organs, organizations and bodies of the United Nations system to co-operate in the implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space.

19. The Committee further noted with appreciation that the Scientific and Technical Sub-Committee had continued to stress the necessity of ensuring continuous and effective consultations and co-ordination in the field of outer space activities among organizations within the United Nations system. The Committee noted with satisfaction that the eleventh Inter-Agency Meeting on Outer Space Activities had been held in 1989 (see ACC/1989/PG/8) and that a report on co-ordination of outer space activities within the United Nations system had been submitted to the Scientific and Technical Sub-Committee (A/AC.105/444 and Corr.1). The Committee also noted with appreciation that the twelfth Inter-Agency Meeting on Outer Space Activities would be held in September 1990 at FAO headquarters in Rome.

20. The Committee noted with appreciation the participation in all stages of its work and in that of its Sub-Committee by representatives of United Nations bodies, the specialized agencies and other international organizations. The Committee found the reports submitted by those bodies helpful in enabling it and its subsidiary bodies to fulfil their role as a focal point for international co-operation, especially with respect to the practical applications of space science and technology in developing countries.

(e) Regional and interregional co-operation mechanisms

21. Regarding regional and interregional co-operation mechanisms, the Committee noted with satisfaction that, pursuant to General Assembly resolution 44/46, paragraph 15, and the recommendations of UNISPACE 82, the Secretariat had continued to seek to strengthen regional mechanisms of co-operation by organizing regional workshops and training courses as part of the United Nations Programme on Space Applications (see paras. 13 and 14 above) and by providing technical assistance to the IOMAC Programme, to ECA, to Member States on the Atlantic Coast of Africa and to the Space Conference of the Americas: Prospects of Co-operation for Development (see para. 12 above). It noted that the Programme was also collaborating with SELPER.

22. The Committee took note of the proposal for regional centres for education in space science and technology, based on existing national or regional educational institutions in developing countries, as outlined in the report of the Expert (A/AC.105/446, paras. 33 to 37). The Committee urged Member States to consider providing voluntary contributions to support that effort.

23. The Committee noted the contributions made by other international organizations towards the implementation of the recommendations of the Second United Nations Conference. In particular, the Committee noted that FAO, through its Remote-Sensing Centre, was continuing its efforts to assist developing countries in the applications of remote sensing. It further noted that ITU was continuing its work in the elaboration of regulatory and technical standards, in providing advisory services on satellite communications to developing countries, in co-ordinating studies on a possible African regional satellite system and in publishing information relating to satellite communications. The Committee also noted that INTELSAT was continuing to develop its system of international communication satellites for use by all countries and was expanding its programme of education and training for the benefit of developing countries.

2. Matters relating to remote sensing of the Earth by satellites, including, inter alia, applications for developing countries

24. The Committee noted that, in accordance with resolution 44/46, the Scientific and Technical Sub-Committee had given priority consideration to the item concerning matters relating to remote sensing of the Earth by satellites.

25. The Committee also noted that, in the course of the debate in the Sub-Committee, delegations had reaffirmed their basic positions relating to remote sensing, which had been reflected in the reports of the previous sessions of the Sub-Committee.

26. The Committee recognized the importance of continuing international efforts to ensure the continuity, compatibility and complementarity of systems for remote sensing of the Earth and to promote co-operation through regular meetings between satellite operators, ground station operators and users.

27. The Committee recognized the example of international co-operation given by the free distribution of meteorological information. All countries and agencies were urged to continue that practice.

28. Some delegations expressed serious concern over the commercialization of remote sensing activities and suggested that the prices of remote sensing data products and access fees for data reception should be reduced significantly so as to make them affordable for the developing countries and enable the latter to benefit fully from the use of remote-sensing technology.

29. The Committee took note of two working papers submitted by the USSR entitled "Remote sensing of the Earth: OKEAN Programme" (A/AC.105/L.186) and "The Priroda package for remote sensing of the Earth (international project)" (A/AC.105/L.187), providing information on the development of two multi-purpose space platforms for continuing investigation of Earth resources and for monitoring the environment.

30. The Committee endorsed the recommendation of the Sub-Committee that, recalling General Assembly resolution 41/65 of 3 December 1986 by which the Assembly had adopted the Principles Relating to Remote Sensing of the Earth From Outer Space, at its twenty-eighth session it would continue its discussion on remote sensing activities conducted in accordance with those principles, during its consideration of the agenda item concerning remote sensing.

31. The Committee endorsed the recommendation of the Sub-Committee that the item should be retained on its agenda as a priority item for the next session and that sufficient time should be allocated for its consideration.

3. Use of nuclear power sources in outer space

32. The Committee noted that, in accordance with resolution 44/46, the Scientific and Technical Sub-Committee had reconvened its Working Group on the Use of Nuclear Power Sources in Outer Space to conduct additional work on the basis of its previous reports and of subsequent reports of the Sub-Committee.

33. The Committee noted that the Sub-Committee had adopted the report of the Working Group as contained in annex III to the report of the Sub-Committee (A/AC.105/456).

34. The Committee noted with satisfaction that the Working Group had reached agreement on recommendations for the safe use of nuclear power sources in outer space and that those recommendations had provided a basis for agreement in the concerned Working Group of the Legal Sub-Committee on a text for draft principle 3 relating to guidelines and criteria for safe use.

35. The Committee endorsed the recommendation of the Sub-Committee that the item should be retained on its agenda as a priority item for the next session.

36. Having reviewed the work of the Scientific and Technical Sub-Committee and the Legal Sub-Committee on this issue, the Committee recommended that the Working Group

on the Use of Nuclear Power Sources in Outer Space should be reconvened at the next session of the Scientific and Technical Sub-Committee.

4. Space transportation systems

37. The Committee noted that, in accordance with resolution 44/46, the Sub-Committee had continued consideration of the item relating to space transportation systems and their implications for future activities in space.

38. The Committee took note of the progress being achieved in the various programmes in operation or planned by Brazil, China, India, Iraq, Japan, the USSR, the United States and ESA.

39. The Committee endorsed the recommendation of the Sub-Committee to continue consideration of the item at its next session.

5. Examination of the physical nature and technical attributes of the geostationary orbit; examination of its utilization and applications, including, inter alia, in the field of space communications, as well as other questions relating to space communications developments, taking particular account of the needs and interests of developing countries

40. The Committee noted that, in accordance with resolution 44/46, the Sub-Committee had continued the consideration of the item relating to the geostationary orbit.

41. The Committee noted that delegations had reiterated and elaborated on the views concerning the question of the geostationary orbit that had been expressed at earlier sessions and reflected in earlier reports of the Committee and its two sub-committees.

42. The Committee noted that ITU had held a Plenipotentiary Conference in 1989 and had made a number of decisions bearing on outer space matters. The Committee expressed its appreciation to ITU for submitting its twenty-ninth annual progress report on telecommunication and the peaceful uses of outer space (A/AC.105/462).

43. The Committee endorsed the recommendation of the Sub-Committee that it continue consideration of the item at its next session.

6. Matters relating to life sciences, including space medicine; progress in the geosphere-biosphere (global change) programme; matters relating to planetary exploration; matters relating to astronomy

44. The Committee noted that, in accordance with resolution 44/46, the Sub-Committee had continued to consider the items concerning matters relating to life sciences, including space medicine; progress in the geosphere-biosphere

(global change) programme; matters relating to planetary exploration; and matters relating to astronomy.

45. The Committee noted with satisfaction that a number of special presentations had been made on those items by specialists from various countries. The Committee expressed its appreciation to COSPAR for its informative presentation on progress in the international geosphere-biosphere (global change) programme. It also took note of the Telemedicine Spacebridge, which had connected medical centres in the United States with Armenia and the town of Ufa in the USSR, following a severe earthquake in Armenia and a train accident in Ufa.

46. The Committee endorsed the recommendation of the Sub-Committee that COSPAR and IAF should be invited to present reports on progress in national and international space activities related to the Earth environment and that COSPAR should be invited to arrange a special presentation on progress in the geosphere-biosphere (global change) programme.

47. The Committee endorsed the recommendation of the Sub-Committee that the title of the item "Progress in the geosphere-biosphere (global change) programme" should be changed to "Progress in national and international space activities related to the Earth environment, in particular progress in the geosphere-biosphere (global change) programme".

48. The Committee endorsed the decision of the Sub-Committee to continue consideration of the above items at its next session.

7. Themes fixed for special attention at the 1990 and 1991 sessions of the Scientific and Technical Sub-Committee

49. The Committee noted that, in accordance with resolution 44/46, the Sub-Committee had considered the item relating to the theme fixed for special attention at the 1990 session of the Scientific and Technical Sub-Committee: "The use of space technology in terrestrial search and rescue and in disaster relief activities".

50. The Committee noted with satisfaction that, in accordance with resolution 44/46, COSPAR and IAF had conducted a symposium on the theme. The Committee expressed its appreciation to COSPAR and IAF for their generous support of the work of the Sub-Committee.

51. The Committee also noted with satisfaction the highly successful international project for satellite-aided search and rescue known as COSPAS-SARSAT. The Committee endorsed the recommendation of the Sub-Committee that all Member States and relevant international organizations consider utilizing to the maximum extent possible the COSPAS-SARSAT system for global search and rescue activities.

52. The Committee further endorsed the recommendation of the Sub-Committee that the new theme fixed for special attention at the 1991 session of the Sub-Committee should be "Applications of airborne and satellite remote sensing for prospecting

mineral and ground-water resources and for monitoring and managing biological resources, with emphasis on agriculture, taking into particular account the needs of developing countries". It also endorsed the recommendation of the Sub-Committee that COSPAR and IAF should be invited to arrange a symposium on that theme, with as wide a participation as possible, to be held during the first week of the Sub-Committee's session after the adjournment of its meetings.

53. The Committee had before it a summary of the scientific and technical presentations made during the twenty-seventh session of the Scientific and Technical Sub-Committee.

54. Some delegations, while recognizing the significance of the scientific and technical presentations to the Sub-Committee, expressed the view that the presentations should not interfere with the substantive work of the Sub-Committee, which should have priority over such presentations.

55. Some delegations expressed the view that the unique role of the Sub-Committee as an intergovernmental forum should be strengthened. Those delegations further expressed the view that the task of the Sub-Committee was to discuss policies and guidelines for international co-operation in space activities and to provide agreed technical parameters in order to help the development of the international regulation of the peaceful uses of outer space.

56. The Committee expressed its sincere congratulations and deep gratitude to Professor John H. Carver upon his completion of 20 years as Chairman of the Scientific and Technical Sub-Committee for his dedicated service and leadership. During that long period of time, his devotion to the work of the Sub-Committee has been an important factor in its achievements in the promotion of international co-operation in the peaceful uses of outer space.

Notes

1/ Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 9-21 August 1982 (A/CONF.101/10 and Corr.1 and 2).

UNITED
NATIONS

A

General Assembly

Distr.
LIMITED

A/AC.105/L.188/Add.2/Corr.1
13 June 1990

ORIGINAL: ENGLISH

COMMITTEE ON THE PEACEFUL USES
OF OUTER SPACE

DRAFT REPORT ON THE WORK OF THE THIRTY-THIRD SESSION

Addendum

B. Report of the Scientific and Technical Sub-Committee on the work of its twenty-seventh session

Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space (agenda items 5 and 7)

Corrigendum

Page 2, paragraph 9

At the end of the paragraph insert

> Some delegations expressed concern that the contributions of space Powers and developed countries had been inversely proportional to their capabilities.

Page 4, paragraph 14

Delete the following sentence from the end of the paragraph

> The Committee further noted with appreciation the contributions of ESCAP, FAO and WMO to those activities.

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90 14866 1601q (E)

UNITED NATIONS

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General Assembly

Distr.
LIMITED

A/AC.105/L.188/Add.3
13 June 1990

ORIGINAL: ENGLISH

COMMITTEE ON THE PEACEFUL USES
OF OUTER SPACE

DRAFT REPORT ON THE WORK OF THE THIRTY-THIRD SESSION

Addendum

C. Report of the Legal Sub-Committee on the work of its twenty-ninth session (agenda item 6)

1. The Committee took note with appreciation of the report of the Legal Sub-Committee on the work of its twenty-ninth session (A/AC.105/457), which contained the results of its deliberations on the items assigned to it by the General Assembly in its resolution 44/46.

2. The Committee noted that the Sub-Committee had elected Mr. Václav Mikulka (Czechoslovakia) as its Chairman, to succeed Mr. Stanislav Suja (Czechoslovakia). The Committee expressed its appreciation to Mr. Suja for his work during his term as Chairman.

1. The elaboration of draft principles relevant to the use of nuclear power sources in outer space

3. The Committee noted that the Sub-Committee, in giving detailed consideration to this item during its twenty-ninth session, had re-established its Working Group on the item, under the chairmanship of Mr. H. Winkler (Austria).

4. The Committee noted the work carried out by the Working Group, as reflected in the report of the Legal Sub-Committee (A/AC.105/457, paras. 23-30 and annex I) and welcomed the consensus reached on the text of draft principle 3 relating to guidelines and criteria for safe use.

5. Some delegations noted that they had joined the consensus on draft principle 3 despite their positions on important points, which should be considered later when the principles are revised. Some other delegations expressed the view that other

points were to be considered by the Scientific and Technical Sub-Committee and by the Legal Sub-Committee in order to facilitate acceptance of the complete set of principles.

6. Pursuant to the recommendation of the Sub-Committee (A/AC.105/457, para. 28), an informal meeting was held during the session of the Committee with a view to proceeding to a first exchange of views of document A/AC.105/C.2/L.154/Rev.6 and to paving the way for further constructive work at the next session of the Sub-Committee. The Committee noted with satisfaction that some progress had been made in the informal meeting.

7. Some delegations expressed the view that there was a need to define the term "launching State". Some of them felt that it might be inappropriate to impose the obligation to conduct a safety assessment on a State which launched a satellite carrying a nuclear power source manufactured by another State.

8. With regard to draft principle 4 relating to safety assessment, it was noted that a Member State had announced that it would make publicly available, prior to launch, the results of safety assessments and that it would submit information to the Secretary-General on how interested States could obtain those results.

9. Some delegations expressed the view that if draft principle 4 provided for a publicly available safety assessment prior to launch, then there might be no need for draft principle 2 on notification of the presence on board a space object of a nuclear power source.

10. The view was expressed that once consensus had been reached on remaining principles, the Sub-Committee should review the complete set of principles in order to consider whether any adjustments would be necessary in order to ensure that the principles were properly interrelated and balanced and that they would achieve their intended effect. Other delegations expressed the view that the nature and content of principles 2 and 4 were different and that they must be considered separately.

11. The Committee urged the Legal Sub-Committee to make further progress in its work on the elaboration of the outstanding draft principles in order to arrive at a final text of draft principles relevant to the use of nuclear power sources in outer space as early as possible.

12. The Committee recommended that the Legal Sub-Committee continue consideration of the item at its next session.

2. Matters relating to the definition and delimitation of outer space and to the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union

13. The Committee noted that the Legal Sub-Committee, in accordance with resolution 44/46, had continued to consider this item through its Working Group under the chairmanship of Mr. E. Zawels (Argentina).

14. The Committee noted that a variety of views had been expressed on the question of the definition and delimitation of outer space, as reflected in chapter II (paras. 31-37) and annex II of the report of the Legal Sub-Committee (A/AC.105/457). Those views were elaborated on and reiterated during the current session of the Committee. Some delegations expressed the view that the question of delimitation was part of the more comprehensive legal question of the applicability of treaties and that it was necessary to have a conventionally defined boundary between air and outer space. Some delegations supported the proposal that any object launched into outer space be considered as being in outer space at all stages of its flight after launch at which its altitude above sea level was 110 kilometres or more. Other delegations reiterated the view that the need for such a definition or delimitation had not yet been established, that attempts to establish prematurely such a definition or delimitation might complicate and impede progress in the peaceful exploration and use of outer space, that consideration of the matter was not productive and that the question of the definition and delimitation of outer space should be removed from the agenda or set aside. Still other delegations expressed the view that in dealing with the question of delimitation account should be taken of the characteristics of the geostationary orbit.

15. The Committee noted the proposal that the Legal Sub-Committee should, at its 1991 session, begin a preliminary exchange of views on the international legal issues relating to prospective flights of aerospace vehicles.

16. The Committee took note of the deliberations on the question of the geostationary orbit as contained in the report of the Legal Sub-Committee. The Committee noted that an exchange of views had taken place on this item, particularly on five general ideas formulated in the "working non-paper" (A/AC.105/430, annex II, para. 20).

17. Some delegations expressed the view that the geostationary orbit was part of outer space and that its legal status was properly defined by the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies 1/ and by the appropriate rules of ITU, which had the value of a treaty. Other delegations expressed the view that the roles of ITU and of the Sub-Committee were complementary and that a special legal régime should be established to regulate the use of the geostationary orbit.

18. The Committee recommended that the Legal Sub-Committee continue consideration of the item at its next session.

3. Consideration of the legal aspects related to the application of the principle that the exploration and utilization of outer space should be carried out for the benefit and in the interests of all States, taking into particular account the needs of developing countries

19. The Committee noted that, in accordance with resolution 44/46, the Legal Sub-Committee had considered the above item.

20. The Committee noted that the Sub-Committee had established a Working Group on the item and had elected Mr. Raimundo González (Chile) as its Chairman. The Committee further noted that the Working Group would be convened at the next session of the Legal Sub-Committee.

21. The Committee noted that a variety of views had been expressed under the new item, as reflected in chapter III (paras. 38-61) of the report of the Legal Sub-Committee (A/AC.105/457).

22. Some delegations expressed the view that in considering international agreements entered into by Member States that were relevant to the principle that the exploration and use of outer space should be carried out for the benefit and in the interests of all countries, the Sub-Committee should take into account treaties, conventions, agreements, principles, declarations and resolutions related to international co-operation in outer space and in general.

23. The view was expressed that initially a review of the norms of national and international law relating to international co-operation in outer space should be undertaken and that subsequently proposals could be formulated to further develop such international co-operation.

24. Some delegations expressed the view that technological differences among States had brought about inequalities in the benefits derived from space activities. They emphasized the need not only to extend the benefits of space science and technology to all countries, but also to ensure non-discriminatory access to the means for developing their own space programmes. They felt that the Working Group should elaborate a set of legal principles with a view to institutionalizing international co-operation. The view was also expressed that the Working Group had not been given a negotiating mandate.

25. Some delegations expressed the view that, for space to become the "province of mankind", the non-discriminatory option to develop space programmes nationally and in co-operation with other States should be extended to all nations, so as to give them real access to space. In this context, they expressed their concern with the adoption of restrictions on the very concept of co-operation resulting from discriminatory regulations on the flow of technical expertise, from difficulties created for the acquisition of equipment related to space activities and from barriers against the dissemination of knowledge. They also considered that these practices are contrary to the central concept of the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Peaceful Uses of Outer Space, Including the Moon and Other Celestial Bodies, which conceived of peace as

intimately related to freedom of information and knowledge and to active dialogue and co-operation among States, in order to promote the peaceful uses of outer space.

26. The Committee recommended that the Legal Sub-Committee should continue consideration of the item at its next session.

Notes

1/ General Assembly resolution 2222 (XXI).

UNITED
NATIONS

A

General Assembly

Distr.
LIMITED

A/AC.105/L.188/Add.4
13 June 1990

ORIGINAL: ENGLISH

COMMITTEE ON THE PEACEFUL USES
OF OUTER SPACE

DRAFT REPORT ON THE WORK OF THE THIRTY-THIRD SESSION

Addendum

D. Spin-off benefits of space technology: review of current status (agenda item 8)

1. In accordance with paragraph 27 of General Assembly resolution 44/46, the Committee took up the consideration of the above item and heard special presentations on the question by an expert from the United States (see para. XX above).

2. The Committee agreed that spin-offs of space technology were yielding substantial benefits in many fields. In medicine, the Committee noted that spin-offs of space technology were providing new techniques for diagnosis and treatment, including an electronic "temperature pill" and a portable X-ray device. In the field of safety, space activities had resulted in the development of anti-glare filters, heat-resistant materials and protective systems for fire-fighters. Spin-offs for manufacturing and construction included dry lubricants, high-performance machines, protective coatings, optical instruments and electronics. Space technology had also given rise to spin-off benefits in the areas of art preservation, environmental protection and agriculture. The Committee noted that the economic importance of those benefits was growing rapidly.

3. The Committee also noted the importance of international co-operation in developing spin-off benefits of space technology and in ensuring that all countries, in particular developing countries, had access to those benefits.

4. The Committee agreed that there was a need to examine ways to strengthen and enhance international co-operation in the field of spin-off benefits of space technology, giving particular attention to those spin-offs which could address the social and economic needs of developing countries. The view was also expressed that consideration should be given to organizing a seminar on spin-off benefits for developing countries as part of the Programme on Space Applications.

5. The Committee recommended that the Outer Space Affairs Division undertake a study of spin-offs, on the basis of information provided by Member States.

E. Other matters (agenda item 9)

(a) International Space Year

6. The Committee agreed that International Space Year (ISY) provided an opportunity to strengthen and expand international co-operation in the peaceful uses of outer space and noted the importance of including all countries in ISY activities.

7. The Committee took note of the proposed programme for the participation of the United Nations in International Space Year as outlined in document A/AC.105/445 and Add.1 and 2. The Committee expressed its appreciation to those Member States that had offered voluntary contributions in support of those activities.

8. The Committee urged other Member States and international organizations to consider supporting additional scientific and technical activities in co-operation with the United Nations as part of International Space Year. The Committee noted that it was particularly important to increase voluntary contributions for ISY activities to be carried out through the United Nations Programme on Space Applications, since the Programme was dependent on voluntary contributions for most of its activities and since ISY activities were to be conducted without any impact on the regular budget of the United Nations or the existing programme of work of the Programme.

9. The Committee took note of national and international activities being planned for ISY. Some delegations described the role of the Space Agency Forum on International Space Year in planning and organizing for International Space Year. The Committee also noted the proposal in the context of the international geosphere-biosphere programme for a series of polar-orbiting satellites called "PEACE" (Protection of Environment for Assuring Cleaner Earth) with sensors for continuous global monitoring of the Earth's environment.

10. The Committee took note of the plans of COSPAR and IAF for celebrating 1992 as International Space Year with a joint World Space Congress to be held in Washington D.C. and a major programme on "Mission to Planet Earth", with an emphasis on the participation of all countries, in particular developing countries.

11. The Committee noted the primary focus of proposed ISY activities on the use of space technology for studying and monitoring the environment. It also noted that the United Nations Conference on Environment and Development was being planned for 1992. The Committee endorsed the recommendation of the Scientific and Technical Sub-Committee that Member States, in planning their activities for ISY, consider ways in which those activities could complement the efforts under way for the Conference.

(b) Space and Earth environment

12. The Committee noted that the General Assembly, in its resolution 44/46, had recommended that more attention should be paid to all aspects related to the protection and preservation of the outer space environment, especially those potentially affecting the Earth's environment.

13. The Committee also noted that the General Assembly, in the same resolution, had considered that it was essential that Member States pay more attention to the problem of collisions with space debris and called for the continuation of national research on the question.

14. The Committee agreed that space debris was an issue of concern to all nations and that it could be an appropriate subject for discussion by the Committee at some future time.

15. Some delegations expressed the view that the issue of space debris should be put on the agenda of the Scientific and Technical Sub-Committee as its next session with a view to exchanging information and sensitizing Member States to that growing problem. Other delegations felt that it was premature to include it on the agenda at the Sub-Committee's next session since much more work needed to be done at the national level.

16. The Committee noted the importance of satellite remote sensing for monitoring and protecting the Earth's environment, and in particular for studying and monitoring global change.

(c) Observer status

17. At its 348th meeting, the Committee decided to grant, at their request, permanent observer status to the International Law Association (ILA) and to ISPRS.

18. The Committee agreed that in the future non-governmental organizations which request observer status with the Committee should have consultative status with the Economic and Social Council and should, as part of their programmes, be concerned with matters falling within the competence of the Committee.

(d) Other

19. The Committee noted with appreciation the participation in its work and that of its sub-committees by the representatives of ESA, INTELSAT, the International Organization for Space Communications (INTERSPUTNIK), the Council on International Co-operation in the Study and Utilization of Outer Space (INTERCOSMOS), COSPAR and IAF. The Committee requested that concerned organizations continue to keep it informed of their activities relating to the peaceful uses of outer space.

20. The Committee recommended that the Secretariat invite Member States to submit annual reports on their space activities. In addition to information on national

and international space programmes, the reports could include information in response to requests from the Working Group of the Whole as well as information on spin-off benefits of space activities and other topics as requested by the Committee and its subsidiary bodies (see para. XX above).

F. Future work

21. The Committee noted the views expressed by the Scientific and Technical Sub-Committee, as contained in paragraphs 105 to 108 of its report (A/AC.105/456), and endorsed the recommendations contained in those paragraphs concerning the agenda of the twenty-eighth session of the Sub-Committee.

22. Regarding the agenda of the Legal Sub-Committee, the Committee recommended that the Sub-Committee, at its thirtieth session, should:

(a) Continue, through its Working Group, the elaboration of draft principles relevant to the use of nuclear power sources in outer space;

(b) Continue, through its Working Group, its consideration of matters relating to the definition and delimitation of outer space and to the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of ITU;

(c) Continue consideration, through its Working Group, the legal aspects related to the application of the principle that the exploration and utilization of outer space should be carried out for the benefit and in the interests of all States, taking into particular account the needs of developing countries.

23. The Committee recommended that the Legal Sub-Committee, on a permanent basis, should rotate the order of consideration of substantive agenda items. Accordingly, at its next session, the Sub-Committee would first take up matters relating to the definition and delimitation of outer space, followed by the new item on outer space benefits followed by the elaboration of draft principles on nuclear power sources.

24. The Committee considered the question of the future work of the Legal Sub-Committee, taking into account General Assembly resolution 44/201 B (section III) of 21 December 1989.

25. Some delegations expressed the view that the traditional three-week duration of the session of the Legal Sub-Committee was not necessary, as had been demonstrated at the current year's session, and that a reduction in the duration would facilitate progress in the Sub-Committee and would result in the more efficient utilization of scarce conference service resources. Other delegations felt that the sessions of the Legal Sub-Committee should be maintained at three weeks to allow sufficient time for negotiations on the complex legal issues before the Sub-Committee and to guarantee substantive results.

26. Some delegations expressed the view that the Legal Sub-Committee should cease the practice of holding alternate sessions at Geneva since there were no discernible benefits to justify either the additional costs thereby incurred by the Organization or the continued exception to the General Assembly principle that United Nations bodies should meet at their headquarters. Other delegations expressed the view that the Sub-Committee's practice of meeting every other year at Geneva was based on a long-standing consensus agreement, that it had been confirmed by the General Assembly, and that it was useful and, therefore, should be continued.

27. The Committee took note of the measures that had been adopted at the twenty-ninth session of the Legal Sub-Committee in order to improve the utilization of conference services. The Committee endorsed the agreement of the Sub-Committee that a similar organization of work would serve as the basis for organizing the work of the Sub-Committee's thirtieth session. The Committee recommended that the Chairman of the Sub-Committee, in co-operation with delegations, should continue his efforts to improve the efficiency of utilization of conference resources by the Sub-Committee.

28. With regard to the question of the venue of the Legal Sub-Committee's future sessions, the Committee noted the different views expressed on the question. The Committee noted that the next session of the Sub-Committee would be held in New York and agreed that discussions would continue with a view to reaching agreement on the venue of its subsequent sessions.

G. Schedule of work of the Committee and its subsidiary bodies

29. The Committee noted with appreciation the invitation by the Government of Austria to hold the thirty-fourth session of the Committee at Graz, Austria. The Committee recommended that its thirty-fourth session be convened at Graz from 27 May to 7 June 1991, hosted by the Government of Austria.

30. The Committee indicated the following tentative timetable for 1991:

	Dates	Location
Scientific and Technical Sub-Committee	19 February-1 March	New York
Legal Sub-Committee	25 March-12 April	New York
Committee on the Peaceful Uses of Outer Space	27 May-7 June	Graz, Austria

31. The Committee recommended that every effort be made in the future to ensure that the sessions of other committees reporting to the Special Political Committee of the General Assembly, particularly the Committee on Peace-keeping and the Committee on Information, are scheduled so as not to overlap with the meetings of the Committee on the Peaceful Uses of Outer Space and its subsidiary bodies.

32. Some delegations expressed the view that in the future every effort should be made to avoid scheduling sessions of the Committee and its subsidiary bodies during periods during which official holidays fall.